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THE PRESENT STATUS OF THE INFLUENZA PROBLEM *

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IT IS NOW CLEAR that the first estimates of the loss of life caused by the influenza pandemic of 1918 were too low. The disclosures of the Census of British India of 1921 and other data that have since come to hand make an estimate of 20,000,000 deaths in the whole population of the world probably not wide of the mark. This is incomparably the worst catastrophe of the sort that has visited the human race since the Black Death of the Middle Ages. In modern times the ravages of neither Asiatic cholera nor the bubonic plague can vie with those of influenza. In Bombay in the worst plague epidemic the city has known (1900) the highest total mortality in one day was 433; at the peak of the influenza epidemic on October 6, 1918, the day's mortality was 768. In England and Wales the highest mortality rate previously reached for any epidemic since registration of deaths began was 3,033 per million population in the cholera outbreak of 1849; the mortality rate from influenza in 1918–19 (46 weeks) was 4,774 per million population (Supplement, Registrar General's Report, 1920).

Judging by the past, nothing is more certain than that we shall some day have another visitation of this destructive infection. It is a commonplace that if it were to descend upon us tomorrow we, as public health workers and students of disease, should be little if at all better equipped to deal with it than we were 7 years ago. It is conceivable, however, that if we occasionally remind ourselves of the gaps in our knowledge we shall be in a position to study more advantageously the manifestations of the disease even in the presence of an epidemic period. There are certainly also lines of direct investigation which can be prosecuted today with some hope of rendering ourselves better prepared to cope with the next epidemic.

Influenza, as the term is ordinarily used, is primarily not a clinical or a bacteriological but an epidemiological conception. We have no sure means of identifying the disease by bacterial examination, and while admitting general clinical resemblance no one can say positively that these or those isolated cases or even small groups of cases seen today are identical with the influenza of pandemic periods. Few doubt that the influenza of 1918 was due to the same causal agent as that of 1889–90 and certain other great historical pandemics, but beyond that reigns a considerable measure of obscurity. At

* Read at the Joint Session on Epidemiology of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 22, 1925.

present, influenza is characterized in our minds by such epidemiological features as its apparently sudden appearance after long intervals of absence or relative rarity, its high attack rate and relatively low case fatality, its independence of seasons, its great diffusive power and its predilection for certain age groups of the population.

In few diseases has the search for the causal agent been so intensive and so widespread. The fall of 1918 found the army camps in the United States provided with well equipped laboratories manned by many of the best trained investigators in the country. Thousands of cases in all stages of the disease were available for examination near at hand. Numerous civilian hospital laboratories were likewise very active. The prodigious amount of laboratory work that resulted had at least one definite outcome. The Pfeiffer bacillus was in the opinion of most investigators dethroned from the position it had long—though not without question—held as the infective agent. Its widespread presence in healthy persons, in non-epidemic periods, its reported absence in some cases of influenza, the lack of marked and consistent specific antigenic reactions, the failure of Pfeiffer bacillus vaccine to protect against influenza, and especially the inability of Pfeiffer bacillus inoculation to produce the disease, have combined to generate scepticism almost amounting to complete negation of the primary rôle of this bacillus in influenza.

To these considerations must be added the important argument advanced by Park and his coworkers that since the strains of Pfeiffer bacillus found in typical influenza cases did not possess antigenic unity they could hardly be regarded as responsible for so sharply characterized an epidemiological entity as epidemic influenza. Altogether, although there are still valiant supporters of the causal rôle of the Pfeiffer bacillus, it cannot be said that the findings in the 1918 epidemic confirmed the importance of this organism in the eyes of bacteriologists the world over. There are few who now believe in its etiological significance.

The remarkable bacterial findings in the respiratory tract of influenza patients and throughout the body at necropsy increased for a time the confusion due to the displacement of the Pfeiffer bacillus. A wide variety of microörganisms was acclaimed as the exciting cause; various streptococci, pneumococci, Gram-negative cocci, bacilli of the pasteurella type and others were by various investigators thought to have a causal relation to the malady. These opinions were modified when it became apparent that one of the noteworthy effects of the influenza virus was the amazing way in which it increased the susceptibility of the lungs to invasion with other microörganisms, that indeed it was to this secondary swarm of invaders that death was generally due. Viewed in this way, the numerous streptococci and other bacteria, and even the Pfeiffer bacillus itself, were to be regarded as of great significance. As Cruveilhier has expressed it: "if grip condemns, the secondary infections execute."

Early in the outbreak, the opinion was advanced that a filtrable virus was the cause of influenza. Some of the work done to test this possibility was too hastily planned and conducted, but the notable investigations of Olitsky and Gates have attracted wide attention. These investigators succeeded in cultivating minute anaerobic bodies from the throats of influenza patients and in carrying out extensive animal inoculations and immunological observations. The bacilloid bodies, as they are termed by their discoverers, have been given the name *Bacterium pneumosintes* (pneumosintes = lung devastator). Strains from the 1918 pandemic and from the 1920 recurrence possess identical antigenic characters. The serum of normal persons does not contain demonstrable agglutinins or precipitins for *Bact. pneumosintes*, but

specific agglutinins and precipitins have been demonstrated in the serum of a number of persons who had recovered from epidemic influenza. Rabbits inoculated with this organism exhibit symptoms and to some extent lesions regarded by these investigators as specific. On continued cultivation pathogenicity is lost. If the microörganism discovered by Olitsky and Gates has not yet won general acceptance as the cause of influenza, it is largely because the delicate and difficult technique necessary for its cultivation has prevented general confirmation; because the results of rabbit inoculation are not unambiguous; because conclusive evidence from human inoculation experiments is lacking; and because a vaccination experiment at Fort Myer with a *Bact. pneumosintes* vaccine prepared by Olitsky gave no evidence of protection. It will probably be generally acknowledged that this is the most promising lead yet secured, but for the time being many workers are content with a suspension of judgment.

On the epidemiological side there are as many unsolved problems as on the bacteriological, perhaps more. Nevertheless, considerable additions to our knowledge have been made. In most European countries the unsettlement of the Great War prevented the prompt and accurate collection of suitable data. In the United States we were more fortunate in that Frost and his coworkers under the auspices of the U. S. Public Health Service obtained soon after the epidemic by house-to-house canvass a body of data adequate for statistical study and not matched by any accumulation of similar material in the history of the subject. Corresponding but less complete data for a smaller population were obtained for several English cities under the auspices of the British Ministry of Health. Frost's data were collected in cities of different sizes and in rural districts, and while not covering the whole of the United States included such representative communities as Baltimore, Louisville, San Antonio, Des Moines and San Francisco. The number of persons included in this canvass numbered 130,033, and among them there were 36,365 cases of influenza. From the analysis of the data it has been determined that great variations in attack rate occurred and that these variations showed no apparent consistent relation to geographic location or size of community or to the rapidity of development of the epidemic. A striking selective incidence in relation to age and sex was manifested, the attack rate being highest in the 5- to 9-year group and declining with almost unbroken regularity in the higher ages in each successive 5-year group. The attack rate in females of all ages was with few exceptions higher than in the males; it was lower in the colored race than in the white. Remarkable differences in case fatality according to sex and age were also brought to light by the figures. Altogether, this work constitutes one of the most fundamental contributions ever made to the epidemiology of influenza.

In the same connection may be mentioned the work of Pearl, who concludes from statistical analysis that there was a definite correlation between the explosiveness of outbreaks in certain American cities and the normal mortality from organic diseases of the heart. The public health significance of this fact is not clear.

Comparative studies have brought out the point that the distribution of influenza deaths in 1918 was different from that in 1889–90, the mortality in 1918 being proportionately greater in the 20 to 40-year group. Apparently, no explanation for this has been advanced. It should be remembered that while mortality obviously depends upon the two components of attack rate and case fatality, the latter component—case fatality—is itself affected by a variety of causes. Since death in influenza is apparently usually due to secondary invaders, any factor that influences the activity of these

invaders for particular age groups will affect the age distribution of mortality. It may be suggested that such a factor may be found in meteorological influences, and that the relatively higher mortality in early life and in persons of advanced years that was manifested in 1889–90, was due in part to advent of the disease in midwinter, and therefore at a season when the age groups mentioned are particularly liable to succumb to pneumonic infections. In the early autumn of 1918 young children and the aged were of course not exposed to the seasonal factors that increase their susceptibility in winter, and the high attack rate of influenza upon the 20- to 40-year group exerted a proportionately greater change in the mortality. Whatever weight such considerations may have, it seems probable that alterations in the age distribution of mortality are more likely to depend on the nature of and susceptibility to the secondary invaders than on fluctuations in the nature of the primary virus.

There are many other points in the epidemiology of influenza regarding which we are nearly if not quite as uncertain as we were before 1918. On the fundamental issue as to whether the pandemic marked the introduction, into Western Europe and North America at least, of a new disease or the flaring-up of an old and common endemic malady, there is radical divergence of opinion. We have discussed this matter elsewhere* and need not here repeat. It may be merely said that if the influenza of 1918 was not a new disease in most parts of the world it certainly was greeted like one and behaved like one. In France in April it was instantly proclaimed as something clinically different from what physicians had been seeing, and was recognized by the older observers as like the influenza of 1889; in Chicago Le Count discovered novel pathological lesions and called in his colleagues to look over them.

In many parts of the world the time of importation of the new disease—if it was a new disease—into a region where the so-called endemic influenza had previously prevailed could be specified to a day. The S. S. Demerara from Lisbon by way of Africa brought influenza to Rio de Janeiro on September 17, and to Buenos Aires on September 25. The S. S. Talune from Auckland introduced influenza into Western Samoa on November 7. Influenza was brought to Tahiti on November 16 on the steamship Navua from San Francisco. Its introduction into certain army camps in the United States is known to the day and hour. Such evidence is clearly not conclusive, but in view of our knowledge about the different types of pneumococci and different kinds of paratyphoid bacilli, it seems permissible to suppose that the virus of epidemic influenza is antigenically not identical with the virus, or viruses, of interepidemic influenza.

The vexed question whether one attack of influenza confers immunity seems to be answered by observations in the latest influenza outbreaks. Although it seems probable that some protection may exist for a short time following recovery, the observations made by the Army Medical Corps, by Frost in Baltimore and by Sharp and the writer in Illinois, agree in indicating that if the epidemic of 1920 was true influenza, as it seemed to be epidemiologically, then little if any immunity remained 16 months after an attack. It is quite plain that an attack of pandemic influenza does not impart any such definite and lasting protection as does an attack of scarlet fever, measles, or smallpox.

The mode of transmission of influenza must remain more or less obscure until we can identify and determine the location in the human body of the exciting agent. In the meantime cogent reasons compel us to believe that the disease is spread mainly if not altogether by human contact in the early stages of the malady

* *The American Journal of Hygiene*, 1922, Vol. 2, p. 325.

or perhaps before symptoms are manifested. The rapidity of spread and other features can hardly be explained in any other way than by supposing that the virus is contained in and disseminated from the upper respiratory tract. Mouth spray and finger-to-mouth infection appear the most likely means of transmission.

It cannot be said that any method of community protection has been worked out. Vaccination against the secondary invaders might conceivably be of value, but the variety of the potentially pathogenic organisms in the respiratory tract is so great and the practical difficulties in the way of administering efficient vaccination on a world-wide scale during an influenza outbreak seem so insuperable that we can hardly make it the basis of a protective campaign. Face masks, however efficient under special conditions, are of limited applicability. Chlorine and similar gases have not yet been proved of decisive prophylactic value. Perhaps the most demonstrably useful methods of protection are certain forms of quarantine and isolation. Under conditions of modern life these are not readily applicable. Isolation such as may be practiced in institutions is sometimes entirely effective. Certain tuberculosis sanatoria in the United States remained entirely free from influenza during the period when the community around them was suffering most severely. Many South Sea islands were severely affected in 1918, but the island of New Caledonia (Peltier) was not invaded until July, 1921.

There are probably certain advantages in simply retarding the advent of influenza into a particular group, since the organisms accompanying the influenza virus may not be either so numerous or so virulent as at the height of the pandemic. No one can hope to prevent altogether another pandemic of influenza by methods of quarantine and isolation. It is believed, however, that something can be done to lower the attack rate in favorably situated small groups, to protect some individuals altogether and to lessen the exaltation of virulence on the part of the accessory microbes. Mortality may be lowered even if morbidity is not greatly affected. Difficult to apply and uncertain of success as it may be, the minimizing of contact seems at present to offer the best chance we have of controlling the ravages of influenza.

EVOLUTIONARY CHANGES IN THE SEASONAL CURVE OF THE BIRTH RATE*

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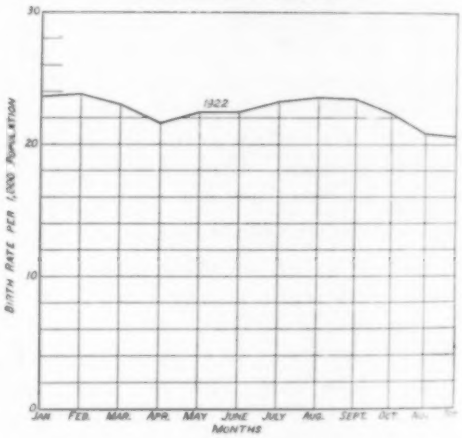
WHENEVER the birth rate is mentioned, the word "decline" immediately comes into our minds due to the emphasis that has been placed on this phase of the birth rate question. In considering the downward trend in the rate of production of offspring, it is customary to use annual death rates, and so far as the writer is aware the possibility that this decline is not uniform throughout the year has been overlooked. The object of the present paper is to present evidence to show that the decline of the birth rate is differential as to season.

That there is a definite seasonal wave in the production of births has been noted by many writers on demography and the form of this seasonal wave has been shown to be similar for most of the civilized countries of the world. As a typical curve of the birth rate by season, we may use that for the United States Birth Registration Area for 1922. We note in the graph that there are two high points in birth production, one in February and the other in August, with minimum points occurring in April and December. Although the maximum and minimum points do not always occur in these particular months, it is true that the general picture does persist of high birth production in the winter months with a diminished production in the spring and early summer months, increasing in the summer months and declining again in the fall. The summer maximum is usually lower than the winter one, and in some cases does not appear, but the winter maximum is almost universal. This winter maximum which corresponds to a conception period in the spring has been taken as indicating that man, although he does produce children throughout the year, is still similar to other animals in that he has one natural mating season.

FIGURE I

SEASONAL BIRTH RATE CURVE FOR THE UNITED STATES REGISTRATION AREA, 1922



The possibility that the decline in the birth rate was producing marked changes in this seasonal curve was suggested by an examination of some figures for the birth rate of Boston,[1] given by months from 1900 to 1921. To test this possibility the decline in the birth rate for each month was examined by fitting a straight line to the values of the birth rate for each month after they had been adjusted to an annual basis and had been corrected for the differences in the lengths of the months.

* Papers from the Department of Biometry and Vital Statistics, No. 121. Read before the Vital Statistics Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 20, 1925.

The slope constant of these lines gave values for the average annual decline in the birth rate of each month. Table I presents the annual birth rate by months for the years 1900 to 1904 together with the average annual decrease in the birth rate and the percentage decrease over the period 1900 to 1921. These values are shown graphically in Figure II, the scale for annual decrease in the birth rate being one hundred times that of the birth rate. If we examine this graph, or the data of Table I, we see that in the months when the birth rate is high the annual decrease is high, and when the birth rate is low the annual decrease tends to be low. This statement also holds when the decrease is expressed as percentage decrease. The probable errors given in Table I show clearly that the differences between months in their rates of decline are significant and are not due to sampling errors. The month of April is particularly noticeable, no decrease having occurred in the birth rate for that month over the 22-year period 1900–1921, although the annual birth rate has fallen from 28.23 * to 25.78 in the same period, a decrease of 8.66 per cent. This raises at once the interesting question as to what the forces are that are causing the birth rate of one month to fall faster than those of another. Before stopping to consider this question, however, it would be well to examine the fact in some other population than that of the city of Boston.

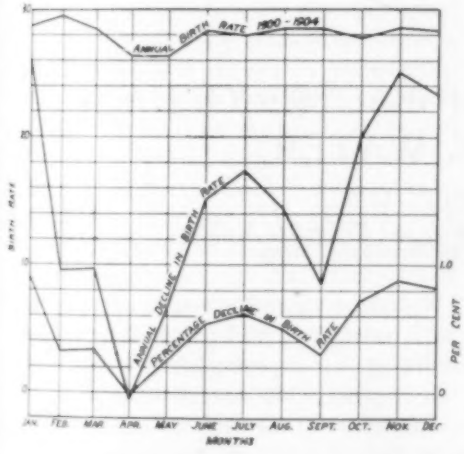
TABLE I

CONSTANTS SHOWING DECLINE IN THE BIRTH RATE BY SEASON

	Boston			London			
Month	Birth Rate for Period 1900–1904	Average Annual Decrease in Birth Rate 1900–1921	Percentage Decrease	Weeks	Birth Rate for Period 1880–1884	Average Annual Decrease in Birth Rate 1880–1914	Percentage Decrease
January	28.73	.260±.029	.91	1– 4	36.04	.320±.011	.91
February	29.50	.096±.033	.32	5– 8	36.94	.351±.009	.94
March	28.47	.097±.028	.33	9–12	36.15	.328±.009	.87
April	26.32	.005±.028	.00	13–16	35.22	.306±.011	.83
May	26.32	.066±.034	.25	17–20	34.90	.278±.011	.78
June	28.28	.151±.038	.53	21–24	33.73	.250±.011	.71
July	27.90	.173±.032	.62	25–28	33.63	.251±.010	.73
August	28.50	.143±.029	.50	29–32	33.50	.277±.008	.81
September	28.46	.085±.027	.30	33–36	33.82	.235±.009	.69
October	27.71	.199±.026	.72	37–40	33.35	.295±.007	.88
November	28.54	.252±.030	.88	41–44	34.91	.326±.009	.93
December	28.32	.233±.026	.82	45–48	34.07	.322±.013	.96
				49–52	32.79	.318±.012	.97

FIGURE II

BIRTH RATE AND ITS RATE OF DECLINE BY SEASON FOR THE CITY OF BOSTON


ANNUAL BIRTH RATE 1900-1904
ANNUAL DECLINE IN BIRTH RATE
PERCENTAGE DECLINE IN BIRTH RATE
BIRTH RATE
PER CENT
MONTHS
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

On comparing Figures I and II we note that the seasonal curve for London in the period 1880 to 1884 differed somewhat

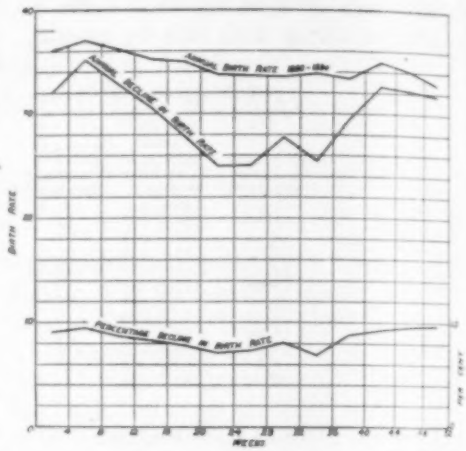
* These figures are quoted from page 10 of reference given.

from that for Boston in the period 1900 to 1904. Both cities, however, show the winter peak with the falling off in the spring. When we examine the rates of decline we find that the average annual decrease and the percentage annual decrease vary with the size of the birth rate, indicating that the decline in the birth rate is differential as to season. This form of differential decrease is evidently tending toward the elimination or the smoothing out of the seasonal curve for births.

Since time intervals of 22 and 35 years are too short for us to consider that this change is indicative of a biological change in mankind, it is obvious that we must look for the explanation in the forces of environment. While many of the factors which affect birth rate, such as birth control, nutrition, etc., come to mind as possible reasons for this differential decline by months, it is unlikely that it is due to any single one of them. Whatever the explanation may be, it is of interest to note that these two populations are becoming more and more uniform in their production of offspring throughout the season.

FIGURE III

BIRTH RATE AND ITS RATE OF DECLINE BY SEASON FOR THE CITY OF LONDON



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THE SIGNIFICANCE OF BACTERIOPHAGE IN SURFACE WATER*

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BACTERIOPHAGE is capable of causing dissolution or lysis of certain susceptible bacteria; this lytic process is transmissible in series and the active principle increases in potency as bacteria are lysed. Several investigators have reported the presence of this bacteriophagic substance in surface water.[1] If surface water does contain such a potent lytic principle, then its effect upon parasitic and pathogenic bacteria found in such water would be of interest from a public health standpoint.

We wish to mention briefly some of the characteristics of the bacteriophage before recording our experiments.

1. A susceptible bacteria must be viable and must be in an environment in which it is growing before the bacteriophage can cause lysis of the bacteria.

2. When susceptible bacteria are placed in a fluid medium, containing bacteriophage, this substance adheres or is adsorbed by the bacteria from the medium. When such sensitized strains are put in an environment that allows reproduction to take place, the bacteriophage causes lysis of the young bacteria with an increase in the potency of the active lytic principle.

* Read before the Laboratory Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 21, 1925.

3. Phage-sensitive bacteria are more susceptible to adverse environment than are resistant strains of the same bacteria.[2]

The experimental procedure is as follows:

A sample of surface water is passed through a Berkefeld candle and some of the filtrate added to nutrient broth and seeded with a susceptible strain of bacteria. Subcultures are made upon the surface of agar plates to determine the presence of irregular colonies or sterile areas on the agar after 24 hours' incubation. In some instances 0.5 c.c. of the filtered water added to 10 c.c. of a young broth culture of *B. typhosus* is sufficient to cause a marked phagic action when immediately subcultured, and leads to clearing of the cultures in a few hours. Where there is only a trace of bacteriophage, the filtered water is added in equal parts to double strength nutrient broth, seeded with a susceptible strain of bacteria and after 24 hours' incubation this culture is passed through the Berkefeld filter and the filtrate added to nutrient broth in the same manner as the original water filtrate from a highly polluted region. This is necessary in order to cause the increased concentration of the phagic substance to make it detectable in quantitative amounts. The faintest trace of bacteriophage can in this way be determined, and by several such passages it can be made as potent as is desired for experimental work. The strong or potent phage made in this way does not differ culturally or antigenically from a phage of high potency isolated from the same surface water close to a domestic sewerage source. As the phage increases in potency it causes lysis of strains that seemed previously to be resistant to its lytic action.

If a susceptible strain of *B. typhosus* is added to some Chicago River water close to the State Street sewer opening and subcultures are made into broth or upon agar, the *B. typhosus* that develops is rapidly lysed and 18- to 24-hour old broth cultures are cleared of visible bacterial growth (Chart I). Susceptible strains disappear from such water more rapidly than do resistant strains. Phage-sensitive strains do not multiply in polluted water and consequently never develop a resistance to the phagic activity. Sensitive *B. typhosus*, *B. coli* and several different *B. dysenteriae* strains have been kept in contact with the filtered water for 7 days. Such strains are as sensitive to phage as the original culture before contact with the bacteriophage containing water.

We have found the bacteriophage to be present in variable amounts in the Chicago River water. The concentration is in direct proportion to the concentration of domestic sewage. The farther away from domestic sewerage source the more diluted is the bacteriophagic substance. We have always found bacteriophage in the water at the opening of the State Street sewer (drainage from the loop district) that was active *B. typhosus*, *B. coli*, *B. dysenteriae* group, *B. paratyphosus B.* and Staphylococcus. Trade wastes cause a rapid disappearance of the bacteriophage from water.

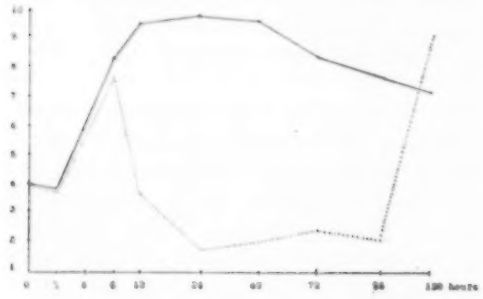
The presence of bacteriophage in surface water is too variable to be used as a criterion of domestic sewage pollution; it does not compare with the recognized bacteriological and chemical methods in determining pollution. From our results so far it would seem that the bacteriophage in water would exert an influence upon the future development of the pathogenic or parasitic strains of bacteria of the gastro-intestinal group, such as *B. coli*, *B. typhosus*, *B. dysenteriae*, etc. If such water with its pathogenic bacteria comes in contact with food material, milk, etc., the growth is accompanied with lysis and it would require several days for a good growth of phage-resistant strain to develop. This can play a very important rôle from an epidemiological standpoint in gastrointestinal infections.

One c.c. of a 24-hour old culture of

typhoid bacteria was added to 50 c.c. of Berkefeld filter Chicago River water, the same amount of bacteria was added to 50 c.c. of Berkefeld filtered Lake Michigan water obtained from an intake crib some distance away from the shore.

CHART I

B. TYPHOSUS ADDED TO BERKEFELD FILTERED LAKE MICHIGAN WATER AND ALSO CHICAGO RIVER WATER AND SUBCULTURED AFTER 3 HOURS' CONTACT INTO BROTH.*



* Heavy line—*B. typhosus* from Lake Michigan water. Dotted line—*B. typhosus* from Chicago River Water. These are the average results of 6 experiments.

After 12 hours' contact 1 c.c. from each was transferred to 10 c.c. of nutrient broth and subcultured after 6 and 12 hours and then every 24 hours for 7 days. One standard loop was transferred to the surface of an agar plate and smeared with a bent glass spreader. The subcultures from the Chicago River water gave the same growth at the 6-hour period as the Lake Michigan water. The 12-hour Chicago River subculture showed bacteriophagic action, the growth was not so good and many of the colonies were "moth eaten" or irregular in outline. The 24-hour Chicago River subculture was sterile, also the 48-hour subculture. The Lake Michigan 24-hour culture gave a massive regular growth. On the fifth day the Chicago River subculture gave a heavy regular growth. Upon examination this culture was resistant to phagic action. This experiment was repeated several times and the viable bacteria were counted by the usual dilution method. The results are shown in Chart I. These graphs represent the average results of 6 experiments. The importance from a public health standpoint of contamination of milk supply or other material with *B. typhosus* from the two sources does not need to be dwelt upon.

Surface water containing a high degree of domestic sewage pollution contains bacteriophagic substances. Phage-sensitive pathogenic bacteria in such water are not as liable to be the cause of an epidemic as the same number of bacteria in a surface water that is free of bacteriophagic substances.

Bacteriological examination of water for pathogenic bacteria can be influenced by the phagic content of such water.

The impregnation of water filters with bacteriophage active against certain pathogenic gastrointestinal bacteria offers a new field of investigation in water purification problems. Of equal importance is the utilization of these tranmissible bacterial autolysins in sewage disposal problems.

NOTE.—The author is indebted to Arthur E. Gorman, Sanitary Engineer, Chicago Department of Health, for his coöperation in securing the water samples and for many helpful suggestions during the progress of this work.

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THE CHEMISTRY OF PROTEINS AND ITS RELATION TO NUTRITION*

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THE PROGRESS made in the field of nutrition during comparatively recent years promises to become notable in the history of modern scientific discovery and advancement. A diet was formerly considered nutritionally complete when it contained adequate quantities of protein, fat, carbohydrate and inorganic constituents. Today we know that this conception of a complete diet was faulty in several respects. Within the last decade or a little more, the discovery of vitamins has added another class of food factors which are essential components of a complete diet. Another serious defect in the old conception of a complete diet is that the food factors were considered entirely from a *quantitative* basis. No regard was given to the *quality* of the food factor. Proteins, for instance, differ greatly in their nutritive value. An animal may thrive on a diet containing 18 per cent of a given protein, while on the same diet containing the same quantity of a different protein, failure may result nutritionally.

The importance and significance of the protein factor in food, in the light of recent investigations, is not generally sufficiently taken into account in the consideration of food values. Practically all of the solid parts of the body of an animal, with the exception of the bones, are composed largely of proteins. Proteins constitute about 18 per cent of the body of the average man. Since an animal is dependent for the formation of its tissue proteins on the protein in its food, this dietary factor is of peculiar importance.

By the action of strong acids, alkalies, or proteolytic enzymes, proteins are progressively broken down into substances of decreasing complexity, until finally some 18 different amino acids result. The same manner of protein degradation occurs during digestion in the alimentary tract. Most proteins contain all of these amino acids in varying percentages. Others may be lacking in one or more of them.

Certain of these amino acids, such as lysine, tryptophane, cystine and histidine, are indispensable for the normal nutrition of animals. They cannot be manufactured by the animal organism, and consequently must be supplied by the food proteins of the diet. These amino acids are usually referred to as "the nutritionally essential amino acids." A protein, for instance, containing all of the amino acids excepting lysine, will enable young animals receiving no other protein in their diet to make little or no growth, because lysine is one of the component units of the tissue proteins of the body. Gliadin, one of the two chief proteins of wheat endosperm, is deficient in lysine, and for a long time was reported as entirely lacking in it. Animals will grow but very unsatisfactorily when gliadin is the only protein in their diet. Addition of 2 per cent of lysine, however, to the same diet renders it adequate for the support of growth at a normal rate.

Zein, the alcohol soluble protein of corn, is also incapable of supporting life long unless supplemented by tryptophane.

* Read before the Food and Drugs Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 21, 1925.

Zein has been shown repeatedly to be lacking in tryptophane.

The results of experiments conducted in this laboratory and elsewhere have shown that the proteins of the common white navy bean will not satisfactorily promote growth in young animals. Fed either the isolated proteins or the raw ground bean as the sole source of protein in a diet adequate with respect to the other dietary factors, rats decline in weight and live but a relatively short time. The addition of 0.2 to 0.3 per cent of cystine to the same diet prevents the decline in weight and enables the rats to grow, although at a subnormal rate. It was also found that heating the bean proteins for a short time improved their nutritive properties, thereby enabling the animals to maintain their weight, but with little or no growth. When the proteins were heated and also supplemented with cystine and incorporated in the diet, the rats grew at a normal rate.

Digestion experiments *in vitro* have shown that phaseolin, the chief protein of the navy bean, is more digestible after it has been cooked. This accounts for the fact that the rats grew better on the cooked than on the raw protein. Similar studies made on the proteins of the lima bean, adsuki bean, mung bean, cow pea and the lentil showed that they also have the same defective nutritive properties.

The nutritively defective proteins referred to, namely, gliadin from wheat, zein from corn, and the legume proteins, constitute the chief proteins in some of our most important foodstuffs, and therefore emphasize the need of giving consideration to the quality of proteins in our nutrition problems. The biological value of proteins is limited not only by their amino acid composition, but also by the degree in which these amino acids when present are available to the animal for assimilation. The availability of the amino acids of a protein may depend on several factors, which mostly may be classed under the general term digestibility.

The defective properties of the navy bean proteins are due to a form of indigestibility which can be corrected by cooking, and also to a lack of available cystine. As yet, we have been unable to discover in what way heating improves the digestibility of these legume proteins. Analyses of these proteins recently conducted in the Bureau of Chemistry showed, to our surprise, that they contained from 0.6 to 0.7 per cent of cystine. This is more than twice as much as there is in casein. A diet containing from 15 to 18 per cent of casein supplies sufficient cystine for the normal growth of rats. The same amount of phaseolin or lentil proteins, however, even when cooked, will admit of but very unsatisfactory growth. This cannot be accounted for, therefore, by a *real* deficiency of cystine in these proteins. For some reason, apparently, the quantity of cystine which they do contain is not available. It seems that the two defective properties of these proteins are due to two different types of indigestibility.

The amino acid deficiency of such proteins as gliadin, zein and phaseolin, however, can be practically and efficiently corrected by supplementing them with other proteins which have an abundance of the amino acids which are lacking in the incomplete proteins.

In Table I is shown the approximate values of the proteins of some common foodstuffs as sources of tryptophane, cystine and lysine, three nutritionally important amino acids. By a proper selection of different types of protein foodstuffs, the amino acid deficiencies of one can be corrected by the supply of these same amino acids present in abundance in another protein.

Much concern is felt these days regarding the possible effect that certain processes used in the preparation and preservation of food products may have upon their nutritive value. Large sums of money are being expended in studying the effect of various treatments upon the vitamin content of foodstuffs, and to

TABLE I

SOME COMMON PROTEIN FOODSTUFFS AS SOURCES OF NUTRITIONALLY ESSENTIAL AMINO ACIDS

Protein	*Tryptophane*	*Cystine*	*Lysine*
Egg proteins	High	Satisfactory	Satisfactory
Milk proteins	High	Satisfactory	High
Meat proteins	Satisfactory	Satisfactory	High
Spinach proteins	Satisfactory	High	High
Nut proteins	High	High	Satisfactory
Wheat bran proteins	High	High	Satisfactory
Zein (corn)	None	Low	None
Oat proteins	Low	High	Satisfactory
Lentil proteins	Low	Low	Satisfactory
Navy bean proteins	Satisfactory	Low	High
Lima bean proteins	Satisfactory	Low	High
Pea proteins	Satisfactory	Low	Satisfactory
Gliadin (wheat)	Low	Satisfactory	Low
Hordein (barley)	Low	Satisfactory	Low
Gelatin	None	Very low	Satisfactory

learn how these vitamins can be best conserved. That the refining and preparation of foods may also yield products greatly inferior to the original foodstuffs in the nutritive value of their proteins, is not so generally appreciated. For instance, the modern milling process used in the manufacture of so-called patent wheat flour removes not only the valuable proteins of the wheat germ but also eliminates in the form of the bran approximately 22 per cent of the total proteins of the wheat kernel. Wheat bran contains from 12 to 17 per cent of protein calculated on the basis of its nitrogen content. Feeding experiments have demonstrated invariably the nutritive superiority of the proteins of the whole wheat kernel to those of the endosperm which constitute the proteins of white wheat flour.

Inasmuch as the proteins of wheat bran had never been isolated, and consequently practically nothing was known regarding their chemical properties, a study of these proteins was recently undertaken in the Bureau of Chemistry. We have isolated from wheat bran three proteins: an alcohol-soluble protein, a globulin and an albumin. Chemical analyses[1] of these proteins show that they differ from the corresponding proteins of the endosperm and germ; and that they contain relatively high percentages of the nutritionally indispensable amino acids, as is indicated in Table II.

Attention is directed particularly to the lysine content of the albumin (4.51 per cent) and to that of the globulin (11.84 per cent); values which exceed those of most other vegetable proteins which have been studied. These percentages of lysine are in marked contrast to those of gliadin of the wheat endosperm, a protein that is so deficient in this essential amino acid that young animals will not grow on it as the sole source of protein in an otherwise adequate diet. The high percentages of tryptophane and cystine in the bran proteins are also noteworthy. When compared, weight for weight, with wheat endosperm or white flour, wheat bran contains from 2 to more than 2½ times as much of the amino acids known to be indispensable for the normal nutrition of animals, with the exception of histidine, which is present in about the same quantity in both cases.

TABLE II

SOME AMINO ACIDS OF THE PROTEINS OF WHEAT BRAN *

(Expressed as Per cent of the Ash- and Moisture-Free Proteins)

Amino Acids	Prolamin Per cent	Globulin Per cent	Albumin Per cent
Cystine	1.65 / 2.29**	1.38 / 1.52**	2.80 / 3.29**
Arginine	4.41	14.13	10.04
Histidine	0.84	2.76	2.57
Lysine	2.45	11.84	4.51
Tyrosine**	3.38	3.69	4.20
Tryptophane***	1.37	2.85	4.76

* The percentages of the amino acids given, with the exceptions noted, were calculated from the results obtained by the Van Slyke method of analysis.

** Determined by the colorimetric methods of Folin and Looney.

*** Determined by the colorimetric method of May and Rose with modifications.

In order to confirm the presence of these amino acids in the bran proteins biologically, and to ascertain to what extent they are available to an animal for assimilation, feeding experiments with albino rats were started. Diets were prepared containing 70 parts of clean wheat bran, free from embryonic tissue and containing but a negligible quantity of starch

from the endosperm. The bran constituted the sole source of protein in the diet, and represented 9.9 per cent of crude protein (N x 6.25). The diets had, in general, the following percentage composition: bran 70, starch 12, Crisco 14, and inorganic salt mixture 4. In order to assure sufficient vitamins, 0.3 gm. of cod-liver oil and 0.40 mg. of Osborne and Wakeman's yeast fraction were given daily apart from the general diet. These feeding experiments have been in progress for nearly a year and have involved a large number of rats. With but few exceptions, all of the animals have grown satisfactorily on this diet containing no other protein than that of the bran, since they were weaned from their mothers. One lot has been on the diet for over 300 days, a length of time representing a large part of the normal span of rat life.

The nutritive efficiency of the bran proteins is indicated, aside from the excellent rate of growth, by the sleek and well nourished appearance of these animals.

The nutritive efficiency of the bran proteins, as measured by the gain in body weight of one lot of rats per gm. of protein intake during the first 6 weeks of the experimental period, is shown in Table III. This lot of rats gained in weight an average of 1.81 gm., and one gained over 2 gms., for every gm. of protein consumed. The efficiency of the bran proteins for growth as represented by these data is from 2 to 3 times higher than that which has been obtained in similar experiments with wheat endosperm, or the patent wheat flour of commerce. Somewhat lower figures were obtained with washed bran than with the unwashed.

The nutritive superiority of the bran proteins, as compared with those of the endosperm, are strikingly shown by the results of parallel experiments conducted with 2 lots of rats. Lot I received the wheat bran diet, the composition of which has already been given; lot II received a similar diet in which the proteins were supplied by white wheat flour. Both diets contained the same percentages of protein nitrogen, equivalent to 9.9 per cent of crude protein. The rats on the flour diet grew at a rate of only one-half to two-thirds of that of those on the bran diet.

TABLE III

GAINS IN BODY WEIGHT PER GRAM OF INGESTED PROTEIN FURNISHED BY WHEAT BRAN DURING A 6-WEEKS PERIOD (9.9 per cent of Protein in Diet)

Source of Protein	Rat	Total Intake		Initial Body Weight	Gain in 6 Weeks	Gain per Gram of Protein
		Food	Protein			
		gm.	gm.	gm.	gm.	gm.
Bran Diet 2 (Unwashed).....	2268 ♀	348	34.4	44	58	1.68
	2269 ♀	288	28.5	46	53	1.86
	2270 ♀	376	37.2	49	61	1.64
	2271 ♀	243	24.0	43	49	2.04
Average.....						1.81
Bran Diet 3 (Washed and ground).	2264 ♂	328	32.5	52	41	1.26
	2265 ♂	331	32.8	46	44	1.34
	2266 ♀	258	25.5	44	26	1.02
	2267 ♂	309	30.6	45	45	1.47
Average.....						1.27

In the light of the results of these experiments, it is of interest to note that the idea is more or less prevalent that bran has little or no real food value. In a book recently published, the statement is made when discussing food for diabetics, that there are certain food substitutes *wholly without food value*, yet serviceable for bulk, such as *bran*, agar-agar, India gum and mineral oil.

It is not uncommon to see popular articles in certain trade journals, in which it is attempted to show that bread made from white wheat flour has as great and even greater nutritive value than bread made from whole wheat flour. Such claims ignore the well known and established facts that little or none of the vitamins contained in the original wheat kernel remain in the highly milled patent

flour, and that valuable mineral salts are also eliminated by the milling process. They are also entirely at variance with the results here presented with regard to the proteins.

The digestibility of bran has been for some time a question of study and discussion. It is generally conceded that bran is fairly well digested by ruminants, which have digestive tracts adapted for the accommodation of coarse, bulky material as hay and fodder, but that animals other than ruminants can digest little or none of it. That satisfactory digestion of bran is not limited to ruminants is demonstrated by the results of our experiments with rats. With only 9.9 per cent of crude bran proteins in their ration, a percentage generally considered near the minimum upon which an animal can grow satisfactorily even with the best proteins, the rats grew normally for relatively long periods of time.

The need of giving foods and nutrition a more prominent place in our social and economic problems is receiving increasing recognition. This is shown by the recently introduced custom in many schools of supplying milk and hot lunches to the pupils, by the large amount of extension work along nutrition lines carried on by state and federal agencies, as well as by local organizations. It is becoming better appreciated that the physical and mental efficiency of our population is largely dependent on being properly nourished. Statistical data collected during the last few years reveal a much greater extent of malnutrition, especially among children, than was formerly supposed, and that its prevalence in rural communities is surprisingly large. Poor nutrition is directly responsible for the high incidence of physical defects and maladjustments of adults as well as of children.

Of the contributing causes for this condition, the lack of understanding of the foods needed for a well-balanced diet stands among the most prominent. It is not so much a question of the quantity as of the quality of the food: not so much how many calories a food can furnish as how many essential amino acids, vitamins and inorganic constituents it contains. since no one food item contains in sufficient quantities all of these essential food factors, their presence can best be assured by a well chosen, varied diet, including more milk, green vegetables, fruits and whole cereals than is included in the diet of the average person.

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SOME OF THE ENGINEERING ASPECTS OF PASTEURIZATION*

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THE DESTRUCTION of bacteria by heat is a progressive reaction. For a given bacterial species, there is a definite death rate corresponding to each temperature within the pasteurizing range. This death rate increases rapidly with increasing temperature, and, at a sufficiently high temperature it becomes so rapid as to simulate an instantaneous killing. Probably the killing is never instantaneous whatever the temperature. At the temperature of pasteurization, there is a well defined death rate in which the time factor and the temperature factor are of equal significance.

The term "thermal death point," as used by bacteriologists, is indeed a misnomer. Bacteriologists long ago learned that in order to obtain consistent data on the thermal death point, or temperature at which death occurs, they must first agree upon a standard time of exposure to the heat. It is now well recognized that for any bacterial species, the so-called "thermal death point" is merely a single point, selected arbitrarily for descriptive purposes from a continuous series of similar points which taken together make up the "time-temperature death curve" of that species.

North has constructed certain of these time-temperature death curves, taking his data from various reported investigations upon some of the pathogens that may occur in milk. His curve for the tubercle bacillus is reproduced herewith (Curve II of chart). It shows that practically complete killing of the organism in question may be obtained by exposure to 155° F. for about 1 minute, to 140° F. for 20 minutes, and to about 138° F. for 30 minutes. A similar curve, also by North, from his own studies, showing the effect of heat upon the creaming property of milk is likewise reproduced (Curve I of chart).

With this introductory discussion of the fundamental principle upon which pasteurization is based, a principle which unfortunately is not any too well known, we may proceed to the subject of the paper.

The title purposely draws attention to the fact that there is distinctly an engineering aspect to the problem of pasteurization. In fact, public health engineering may well claim pasteurization as one of its important branches, for the design and operation of pasteurizers are wholly matters of engineering. On the other hand, the facts as to the time-temperature death curve data upon which the entire process is based, must first be determined by competent bacteriologists. It is not the present purpose to discuss these data critically. As engineers we must assume the correctness of the basic data. Any modification the bacteriologists may later decide upon can readily be introduced into our procedure, without influencing in any material way the general principles upon which we may agree.

SUITABLE TIME AND TEMPERATURE

The two curves used to illustrate the basic data have been selected from a series

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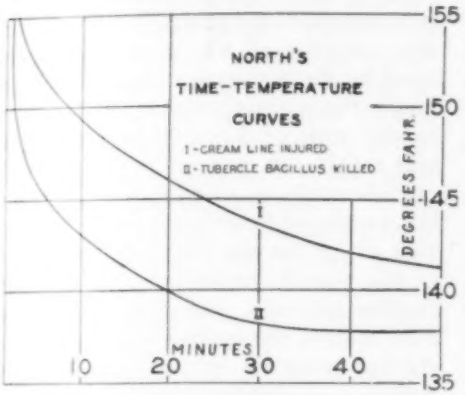
of curves published by North. The curve for the tubercle bacillus is the uppermost of four curves for pathogens commonly found in milk, while Curve I, showing the beginning of the effect of heat in reducing creaming, is the lowest of five curves relating to the physical and chemical properties of milk.



Any point on the chart above Curve II represents a time-temperature combination that will destroy the tubercle bacillus as well as those other pathogens, the curves of which lie below Curve II. Similarly, any point below Curve I represents a combination which will not injure the creaming properties, nor affect any of the other properties represented by North's other curves.

The primary object of pasteurization is the destruction of pathogenic bacteria, but commercially, and possibly from a nutritional standpoint, the physical and chemical properties of the milk must remain unimpaired. Thus, in pasteurization we are restricted to time-temperature combinations lying within the area between these two curves. Any such combination ought to yield a safe milk of satisfactory commercial quality.

To the engineer, however, other factors are at once apparent. We must have a reasonable limit of tolerance. At the extreme left, pasteurization at 155° F. or over for 1 minute or less is indicated as a possibility. This is the old flash method, discarded early in the history of pasteurization because of its proven unreliability. An engineer can readily see that the difficulty of control within this region is altogether too great for a commercial process of this sort.

Between 10 and 30 minutes, the indicated zone offers ample tolerance for good control as to both time and temperature. It is significant that a time of 30 minutes has been quite generally accepted, despite obvious commercial advantages of shorter periods. This time was apparently established by adding a margin of safety to the time employed by Rosenau in his studies of the tubercle bacillus.

Twenty minutes happens to be a standard time adopted by bacteriologists for the determination of thermal death points. It has no particular significance. Had Rosenau and others adopted a 10-minute period in their studies of thermal death points, pasteurization would in all likelihood now be established upon a 15- or 20-minute basis.

At 30 minutes there is a temperature range of 5° in the restricted zone. At the midpoint of this range (141° F.), there is a time range of 30 minutes within the zone so that the permissible tolerance at 142° F. and 30 minutes is $\pm 2°$ and ± 15 minutes. This is obviously disproportionate, although the indicated temperature tolerance is well within commercial possibility. On the other hand, with a 15-minute holding at 144° F., the permissible temperature range is $\pm 3°$ and the time range ± 10 minutes, while at 10 minutes holding at 146° F., the tolerance becomes $\pm 3.5°$ and ± 8 minutes. Making all due allowance for the necessary uncertainty in the basic data, it is clear that the possibilities of pasteurizing at holding periods of 10 to 15 minutes have not been properly appreciated, and that from an engineering point of view such procedures are entirely feasible and would represent considerable economy in equipment.

Whatever time period be adopted, it is clear that a corresponding temperature exists midway in the zone, which gives a

maximum range of permissible variation. At 30 minutes this temperature is about 141° F. To the writer's mind, this fact, assuming always the accuracy of the data, is a sufficient answer to the question now so much under discussion as to whether pasteurization should be performed at 142° F. or 145° F. The latter temperature is above the line at which cream volume is diminished and allows no proper tolerance in an upward direction.

TEMPERATURE CONTROL

It is a distinct advantage of the holding method of pasteurization over the flash method that in most of the holding systems employed there is considerable opportunity for mixing after heating. This mixing tends to average the temperature of the heated milk and makes permissible a certain degree of variation at the heater. Only in the continuous flow type of holding system is a close temperature regulation required. Automatic temperature controllers of several types are available, readily capable of controlling within 2° of the required temperature. The variations are of a periodic character, consisting of regular short time swings of half-minute intervals or thereabout. Such variations are partially absorbed in the metal pipe, and are evenly averaged out within a few minutes in the holding tank of the vat or pocket type.

As a general rule, more even temperatures are obtained with the larger volumes of heating water. In the heaters of the so-called barrel type in which a fixed and relatively small amount of water is held in the heater and itself heated by live steam, the control is more difficult and the resulting temperature record generally more ragged than in the tubular heaters having a circulating water supply externally heated.

For the more accurate control necessary in the continuous flow holders, the writer has found it desirable to employ a rather large auxiliary tank through which the heating water is circulated and in which a constant temperature is maintained by automatic control of the temperature of the returning water stream. The tank irons out all temperature waves due to the control mechanism.

Under proper conditions, such a water supply gives a smooth milk temperature chart. The essential conditions are a constant rate of flow of both milk and water, and not too great variation in the temperature of the cold milk. The greater the variation of the latter, the greater must be the water to milk ratio and the longer the heating system. With a water to milk ratio of 5 to 1 and a heating system capable of working with water only 10° above the required milk temperature, this system of heating will reduce a variation of 10° at the cold milk end to one of less than 1° at the heated end without further control. This type of temperature control, the control being entirely on the hot water, is one deserving of more serious consideration than it has hitherto received.

Temperature control must also be applied during the holding period. In addition to suitable insulation of the major apparatus, it is necessary most carefully to avoid exposed pipe, especially outlet connections from the bottom. In some tests of a well planned modern plant in which every precaution had been taken to secure results as nearly perfect as possible, a temporary thermometer was inserted in the outlet pipe which held about 1 gallon of milk, between the insulated portion of the holder and the valve. During the holding period the temperature in this pipe dropped 17°, while the drop in the holder itself was less than 1°.

Another fact of importance is that even an insulated tank will permit some cooling and this occurs at the walls. Convection currents flow down the walls and cool milk accumulates at the bottom. An average drop of 1° during holding may mean an actual drop of 5° at the bottom of the holder. This emphasizes the importance of thorough insulation, and the great advantage of a heated water jacket such as was used in some of the older equipment.

RATE AND TIME CONTROL

In the positive holding devices, the batch pasteurizers and the pocket type of continuous system, the holding time is, within the limits of the equipment, independent of the rate of milk flow, and is governed either manually or mechanically. In these cases, it is merely necessary to make sure that all the milk goes through the apparatus as intended. Valves such as are used on most pasteurizing equipment are seldom tight. The leakage is generally small but carelessness in this direction may lead to serious by-passing. A most urgent need is apparent for valves that are actually non-by-passing. This does not mean the manufacture of a tight valve, but calls for a new design which after being dented and worn in service may leak badly but in such a manner that it cannot by-pass.

In the continuous flow type of holder, time of holding is dependent first of all upon rate of flow and in such systems the rate has the same importance as the temperature. It should be controlled by an orifice or other hydraulic device, incapable of change by the operator, or manually in connection with an indicating and recording rate meter. In the latter case, the record should have the same status as the temperature record. It is indicative of the lack of appreciation of the fundamental importance of the time factor that ordinances require permanent temperature records of the operation, and yet leave the rate of pumping, and consequently the holding time in continuous systems, entirely at the discretion of the operator.

HOLDING TIME IN CONTINUOUS FLOW HOLDERS

In holders of the continuous flow type we define the ratio of the total capacity to the rate of flow per minute as the nominal holding time. Assuming steady stream-line flow at uniform velocity throughout the cross section, the nominal holding time would also be the effective holding time. Any interference with such ideal flow makes for an uneven distribution of velocity and for the passage of a portion of the milk in less than the nominal time.

In continuous flow holders of the older type, vertical cylindrical tanks of large cross-sectional area compared with the height, there are numerous factors which interfere with uniform distribution of velocity. They may for convenience be classified as mechanical and thermal. The mechanical factors are velocity of entrance, uneven distribution of lines of flow at inlet and outlet and excessive velocity through the reduced openings of baffles. The thermal factors which lead to thermal convection currents are variation in the temperature of the incoming milk, and cooling at the walls through imperfect insulation.

All these factors are subject to fairly satisfactory control by good design. Velocity of entrance and uneven distribution are cared for by the use of a series of perforated baffles. Such baffles should have a relatively large area of opening, 15 per cent, so as to introduce little hydraulic resistance with its consequent disturbing velocity. To provide distribution they should be used in multiple, with openings mismatched or staggered. Distribution at the outlet may be secured by the usual type of baffle providing a considerable loss of head.

The thermal factors are provided for by use of a specially good temperature regulation, previously referred to, and by thorough insulation. The best results are obtained by housing the equipment in a small room in which a temperature a little over that of the milk is maintained by thermostatic control.

At best the hydraulic conditions in this type of holder represent a carefully balanced system of stability. The use of this type of equipment is justified only when every detail of satisfactory design has received attention, and then only with heating systems capable of control more accurate than usual. Furthermore, its operation must be most carefully attended.

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HOLDING TIME IN CONTINUOUS FLOW HOLDERS

In holders of the continuous flow type we define the ratio of the total capacity to the rate of flow per minute as the nominal holding time. Assuming steady stream-line flow at uniform velocity throughout the cross section, the nominal holding time would also be the effective holding time. Any interference with such ideal flow makes for an uneven distribution of velocity and for the passage of a portion of the milk in less than the nominal time.

In continuous flow holders of the older type, vertical cylindrical tanks of large cross-sectional area compared with the height, there are numerous factors which interfere with uniform distribution of velocity. They may for convenience be classified as mechanical and thermal. The mechanical factors are velocity of entrance, uneven distribution of lines of flow at inlet and outlet and excessive velocity through the reduced openings of baffles. The thermal factors which lead to thermal convection currents are variation in the temperature of the incoming milk, and cooling at the walls through imperfect insulation.

All these factors are subject to fairly satisfactory control by good design. Velocity of entrance and uneven distribution are cared for by the use of a series of perforated baffles. Such baffles should have a relatively large area of opening, 15 per cent, so as to introduce little hydraulic resistance with its consequent disturbing velocity. To provide distribution they should be used in multiple, with openings mismatched or staggered. Distribution at the outlet may be secured by the usual type of baffle providing a considerable loss of head.

The thermal factors are provided for by use of a specially good temperature regulation, previously referred to, and by thorough insulation. The best results are obtained by housing the equipment in a small room in which a temperature a little over that of the milk is maintained by thermostatic control.

At best the hydraulic conditions in this type of holder represent a carefully balanced system of stability. The use of this type of equipment is justified only when every detail of satisfactory design has received attention, and then only with heating systems capable of control more accurate than usual. Furthermore, its operation must be most carefully attended.

The shortcomings of the continuous flow type of holder seem to have been entirely obviated in the case of one design now on the market. Instead of short upright cylinders, long horizontal pipes of 6 or 7 inches in diameter are employed. These are arranged in stacks connected at the ends with return bends. The whole is enclosed in a housing capable of being heated. The milk flows through a total length of some 300 feet.

Pure stream-line flow through such a device should result in a central velocity some 25 per cent greater than the mean. By increasing the length, however, until the velocity of flow exceeds the critical velocity, a turbulent flow is obtained, providing lateral mixing and off-setting this effect. The result is a remarkably even flow of the milk and uniform time of holding.

INDICATING AND RECORDING DEVICES

Thermometers found about a milk plant are usually of poor quality and inaccurate. Manufacturers should be induced to equip with reliable instruments. In particular, thermometers should have safety expansion bulbs above the scale to prevent strains and breakage during the preliminary warming up or final washout with hot water. Most thermometers have a scale poorly adapted to the purpose, with closely packed 2° lines and an unnecessary range. A special thermometer, covering a very limited range and with widely spaced single degree marks, is much needed and would undoubtedly be furnished if demanded.

The same criticism applies to the recording thermometers. In addition, their adjustable feature, usually open to the operator, makes their charts an extremely unreliable record. Fortunately there is on the market a short-range recording thermometer made especially for this purpose. The pen makes a narrow line over widely spaced single degree marks instead of the usual wide red mark covering about 2 whole degrees.

Thermometers of this sort should be under lock and key, out of reach and out of sight of the operator. Their sole function is to give a true and permanent record of his work. The control of the operation should be based upon the regular equipment thermometer. On continuous flow systems a flow meter is as important as a thermometer and its readings should also be recorded.

TESTING

Testing the pasteurizing equipment for time and temperature is an engineering function. In positive holders this involves merely a checking of thermometers and of the mechanical control system. Equipment of this sort should, however, be tested for leakage and by-passing. This may be done with the use of dyes. Testing a continuous flow holder is a matter of more difficulty. It involves the addition of color during a continuous run, under conditions which preclude gravitational streaming of the dye solution by reason of its specific gravity. Samples of the effluent are collected for color reading. It is of little importance to determine the first appearance of colors, unless it be for a purely technical application of the law. The color solutions usually applied are powerful and as the writer uses them, capable of being read in less than 1 per cent of their original dilution at the top of the holder. Obviously, it is of practical importance to know how much milk is being held for any given period less than the nominal holding time.

The importance of the thermal effects has been sufficiently stressed to indicate the futility of any test made with cold water. The plant should be operated in the regular manner and the ideal test would be one made with milk. Its results should be expressed in the form of a table or plot showing the percentage of the total milk passing through in less than any specified time. This information is obtained by comparing the intensity of the color in a series of samples with that of the original colored water entering the holder.

THE VALUE OF HEALTH DEPARTMENT REPORTS*

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HEALTH DEPARTMENT reports are published annually or biennially by at least 38 states, and by 80 or more cities of the United States and Canada, in addition to several cities in which the report of the health department is embodied in the combined review of the activities of various municipal departments. Lack of funds prevents the publication of reports in a few states and in many cities, although their preparation is usually required by law. In 15 representative cities, the printing expense alone for 18,150 copies amounts to $9,800. On this basis the cost of printing the city and state health department reports of this country must total considerably over $75,000 a year, not to mention the expense and labor involved in their preparation. Are these reports sufficiently valuable to justify this expense? What is their purpose, and for whom are they prepared? In an attempt to answer these questions a large number of reports from a variety of sources has been studied.

Early health reports are both interesting and enlightening. The scope of certain of these reports is indicated in the first Connecticut report of 1878. Section 9 of the act of the general assembly establishing a State Board of Health, as contained therein, "Requires that said board, on or before the first day of December in each year, shall make a report in writing to the Governor upon the vital statistics and the sanitary condition and prospects of the State, which report shall also set forth the action of said board, and its officers and agents, and the names thereof for the past year, and shall contain a full statement of their acts, investigations, and discoveries with such suggestions for further legislative action or other precautions as they may deem proper for the better protection of life and health. This report shall also contain a detailed statement of the moneys expended by said board, and the manner of their expenditure the year for which it is made."

While this particular regulation has been altered to provide for biennial rather than annual reports, the general provisions are essentially the same as those of 47 years ago, and are similar to the regulations of other states in this regard. Section 402 of the compiled laws of the State of North Dakota "Requires that the Superintendent of Public Health shall make a biennial report to the Governor on each even number of years, covering any activities carried on by him, as well as those of the county and city health officers." Under the statutes of Massachusetts, the board of health in each city is required—"annually in January to make a full and comprehensive report to the city council of its acts during the preceding year and of the sanitary conditions of the city."

Reports vary considerably in attractiveness, in scope, and in subject content. In order that the report may be sufficiently interesting to reach the public, consideration in its preparation must be given to

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at least three factors: mechanics, strategy, and journalism. The size of the reports is usually 9 x 6 inches, allowing about 6½ x 3¾ inches for the printed page. The number of pages ranges from a single statistical sheet to 348 in New York, and 448 in Chicago, the majority of reports, however, containing from 30 to 100 pages. If the report covers more than 50 pages, an index, or at least a table of contents should be included. Folded inserts are not infrequently used for statistical tables. It is believed that these inserts should be avoided so far as possible and vertical tables utilized.

Much depends upon the general impression of the report as conveyed by the cover. The colors selected indicate a wide variety of tastes, varying all the way from different shades of grey, brown, blue, yellow, and green, to bright red, and maroon, in the order mentioned. As Hedrick [1] and others have pointed out, many of the reports lose their chance to be examined at the outset, by a cover clad in a dull, sickly looking color. Too little attention is given to the type and arrangement of the printing on the cover, and on the title page. The use of the city seal on the cover often adds to its attractiveness. Simplicity is also desirable. Some of the best examples of good covers of health department reports are those of Connecticut, Massachusetts, New York, Providence, R. I., East Orange, Montclair and Newark, N. J., and Newton, Mass. In the body of the report, care should also be exercised in the choice of type,[2] in the arrangement of pages and charts to prevent crowding and to allow proper spacing. Good typography is a distinct asset in any printed report.

There is also considerable variation in the manner of presentation of vital statistics. There is evidently more uniformity in this regard, however, than when the situation was carefully studied in 1912 and 1913 by a committee of the Massachusetts Association of Boards of Health,[3] of which Dr. Charles V. Chapin was chairman. The International list of Causes of Death, in full or in abridged form, was utilized in 60 out of 90 reports published in 1923 and 1924 and reviewed by the writer. An alphabetical list or some special form of tabular statement was utilized in 20 reports, while 10 gave no statistical tables whatever. Although practically all the reports contained a statement as to the population of the city or state, it was frequently necessary to spend considerable time in searching for this information.

The necessity for uniformity in national, state and municipal vital statistics reports was emphasized by Wilbur [4] several years ago, and the elements of a complete mortality and morbidity report have been presented by Emerson [5] more recently. It is hardly necessary to note that statistical tables without accompanying summaries and discussions are of relatively little value.

A few of the health officers prepare an organization chart showing not only the organization of the department, but in certain instances its relation to other agencies in the city. Other health officers present a detailed statement of the personnel employed in the health department. Such a statement is considered particularly desirable in small cities, but becomes somewhat cumbersome in large cities, where it would seem more fitting to print merely the names of heads of bureaus or divisions in the organization scheme. Only about half of the health department reports contain a statement of receipts and expenditures for the year, and a small proportion of these are classified under functional headings. Curiously enough, one of the reports gives the appropriation for nearly all the important city bureaus except the health department.

Several of the recent reports have contained excellent illustrations in the form of graphs indicating disease trends, as in Detroit and in Newark, and of photographs as in Chicago, Colorado Springs, and Dayton. A front page feature of the

1924 East Orange report is a graphic representation of the score of city health activities based on the national rating schedule. The reports of the Connecticut State Department of Health, and of the cities of New Haven, Conn., and Winston-Salem, N. C., also contain features of financial data portraying the economic aspect of health work. In the Connecticut 1921 report, for example, by applying the methods of calculation promulgated by the International Conservation Commission, it is found that the prevention of deaths and sicknesses represents a saving to the people of the state of over 10 million dollars for the year as compared with the losses sustained five years previously. The net profit on 2 million dollars expenditure was 8 million dollars. By this means a health administrator may calculate in monetary terms his losses or savings affected in human lives from year to year.

The present tendency is toward a form of report which will be easily read and instructive to the common citizen, rather than a mere statistical résumé which is of interest only for reference purposes. Several reports serve an important purpose in acquainting city officials, interested citizens, and health workers with the results obtained in health administration in a given city, county or state, and also in pointing out matters that should receive attention in the future. Others are not easily read, but give one the impression that "annual reports on the whole were provided simply to render accounting of funds expended and technical services rendered, and destined for immediate relegation to the musty files and gloomy record shelves. We presume they constitute the printed documents of the year. Why should they be so deadly?"[6] The scope and usefulness of health reports have broadened with advances in sanitary science so that they occasionally contain information of more than local interest.

It is believed that the primary purpose of health department reports is to give a health accounting for the year for the benefit of local citizens and officers, but in recent years, particularly, other health department organizations and officers have profited by an exchange of reports. To quote from a letter from one health director: "There are some states and large cities whose health reports are to us as valuable as any general treatise. Teaching institutions, especially those concerned with physics, biology, and physical culture frequently make use of our annual reports. Teachers often request copies for use in their classes, while civic organizations, woman's clubs, and others find them helpful." The general mailing list usually contains the names of health departments, universities, physicians, nurses, teachers, state and city officials, social and health agencies, insurance companies, and libraries. One health officer writes that "while these reports owing to a small circulation may be of limited value to the community at large, they are of assistance to us as a medium for informing the more interested portion of the public of the actual work of the department, and they enable us to get closer in touch with physicians, and nurses, teachers and others whose coöperation we desire and upon which, to a large measure, we depend." Another health officer states that "the annual report serves its purpose in explaining to the public the work performed by the health department, indicating the progress in health activities. It is of service to other health departments for their information and comparison with their own activities."

The publication of a formal report has either never been attempted or has been discontinued in several cities. In Detroit, for example, it was found by experience that the report came out too late to be of value locally. There has been substituted here, as in Milwaukee and in certain other cities, a brief review of the activities of the various city departments. Several hundred thousands of these are distributed in the city of Detroit through the schools, clubs and other organizations. The state-

ments contained in these reviews are particularly designed to interest the lay reader as well as health worker. In certain other cities, as in Hartford where a formal report is published, the health officer has been successful in having the essential facts of his report published in sections in the daily press. In this way practically all important facts in the report are published as news items and are read by more people and earlier than would be possible if such facts were not made available until the report came from the printer.

SUMMARY

It is believed that three major functions of a health report should be considered in its preparation, namely: 1. Accounting and administration features, 2. Public health education, and 3. Statistical analysis. Furthermore, the audience for which the report is designed must be kept clearly in mind. As Willmott [7] has well stated, a public report should present the activities, plans and problems of a government in such a way as to display the amount of services rendered in return for tax dollars expended. "It should state frankly the handicaps and disadvantages under which the department operates, and it should outline the direction in which the scope of departmental activities should be extended." A well developed outline of matters which should receive attention during the coming year is of immense value. It is not sufficient merely to compile this information in a voluminous report and make it available to the public, it must be arranged and presented in such a manner that those receiving it will find it both attractive and interesting. The report which appeals most strongly is one which has an attractive cover, is well bound and well printed, in clear type on suitable paper, illustrated with condensed tables, graphs, charts, or diagrams and a few photographs. Outstanding features of the report should be circulated as widely as possible through the public press and city bulletins, and those phases dealing with health department organization, and general administrative procedures could well be brought to the attention of school children in order that they might gain some impression at least of the fundamental machinery available for health preservation.

In conclusion, it may be stated that the health department report is the official organ through which that branch of government responsible for the supervision of community health may give to the public regular and authentic information of the state of health of its people, together with an organized account of its stewardship. As such, it merits thought in preparation and care in publication in order that its greatest value may be achieved and health promotion be assured and extended.

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MORBIDITY STATISTICS*

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IN THE PRELIMINARY tabulation of *The Incidence of Illness in a General Population Group — Hagerstown, Md.*, published by Sydenstricker,[1] there was pointed out the striking contrast which resulted when the health of a community was gauged by its mortality rate and by its morbidity rate. While less than 20 per cent of the mortality rate was ascribable to respiratory diseases, almost 60 per cent of the morbidity rate was due to this cause. The percentage of morbidity due to the diseases and disorders of the digestive system was almost double that of the mortality from these causes. On the other hand, the percentage of the lethal rate from diseases and disorders of the nervous system was almost treble that of the morbidity rate.

If this painstaking canvass of 28 months' duration did nothing else but establish in a more or less definite manner the need of differentiation between mortality and morbidity in the approach to the health problems of a community, it would have been amply worth while.

With the development of medical science, wider hospitalization and the broadening effects of preventive medicine and health education, the numerical relationship between mortality and morbidity has undergone and will continue to undergo a shifting of sufficient moment to make hazardous the approach to the problem of illness via the mortality rate alone.

Aside from the requirements of public health administration, there are many social and economic reasons why more or less refined morbidity statistics are desirable.

We all remember the movement of a decade ago for compulsory health insurance and the lamentable dearth of data upon which to base an approximation of a reliable character as to the cost of carrying out the several schemes proposed. The social distribution of the economic "risk" of illness is bound to come in one form or another sooner or later, and the possession of facts with regard to morbidity is an essential prerequisite for a sound policy. Definite knowledge of this kind could serve as a foundation for legislative action to control with reasonableness the premiums demanded by casualty companies writing health insurance.

The cost of illness in suffering, disability, individual and family catastrophes, and economic wastage is too great not to demand a better social accounting!

The intelligent planning of the several types of communal facilities for the treatment of disease is impossible without a foundation of fact as to the extent, character and distribution of sickness incidence, the duration of illness and results of treatment under various environmental conditions. As an illustration, may be mentioned the fact that, when in New York City it became apparent recently that there were no adequate facilities for placing in institutions adolescent boys convalescing from illness, the question was raised as to the extent of morbidity in this age group. There were no data which could throw adequate light on the question as to the extent of the need for accommodations of this kind. In this

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connection, it may be added that the lack of data on the relation of school life to morbidity during the period of adolescence has been emphasized by many students of educational hygiene, but little progress has been made.

Scientific studies in social biology would likewise be facilitated if comprehensive data concerning morbidity were available. The vital researches on the influence of heredity and environment in the life cycle could be pursued much further if adequate statistical facts were at hand. Medical science would likewise profit by the study of morbidity data *en masse*.

Enough of casual effort in various connections has been expended of late to warrant the assumption that the time is ripe—in the famous phrase of Alexander Hamilton—to "try to think continentally" about it and to institute a movement for registration of morbidity data on a national scale.

Historically, the earliest attempts to gather sickness statistics in this country related to infectious diseases and were initiated by boards of health. The first national inventory of general illness was attempted in the census of 1880. In this census, as well as in the succeeding one of 1890, an attempt was made to register those who were, on the day of the enumeration (in both instances, June 1), so sick or disabled as to be unable to pursue their ordinary occupations. The returns were in many respects imperfect and tabulations were made of certain areas only. On the basis of these tables the approximate incidence of disease by age groups, sex and color was ascertained. In view of the doubtful accuracy of many returns, conclusions were drawn with a great deal of hesitancy and reservation. One of the conclusions was that "the proportion of sick in the total population over 15 years of age, in the specified states in 1890, was greater among males (17.60 per M) than it was in 1880 (13.41 per M), but that it was somewhat less in 1890 among females (10.73) than it was in 1880 (12.15)." An important question which cannot be answered with any degree of certainty is: Has the relationship as indicated in the comparison of the two partial census return tabulations continued, or has it changed; and if changed, in what respect?

The several fragmentary local sickness canvasses conducted since and other attempts to utilize the various available sources of supply have been very valuable. They were, however, only sporadic attempts and, of course, very much circumscribed in the area covered. Periodic stock taking of the prevalence of illness is needed, and I would like to submit that the American Public Health Association urge the resumption on the part of the Census Bureau of gathering decennially facts as to the prevalence of illness. The task will probably be easier in 1930 than it was in 1880 or 1890!

Census data of this type will supply a starting point for intensive studies, for at best census figures cannot yield more than crude general rates by sex, color, age, section of the country, and occupation, and cannot refer but to a point in time. Intensive sickness studies require a more elaborate basis of fact than an ordinary census enumeration can furnish. Furthermore, incidence of disease within a given period of time can only be ascertained accurately in a restricted local area by repeated registration, as was done in the United States Public Health Service study at Hagerstown, already referred to. The first attempt to obtain the sickness experience during a year of a typical cross-section of the population was presumably that made in 1918 in New York City by the Public Health Committee of the New York Academy of Medicine and published in *Modern Medicine*.[2] Studies of this character showing the illness experience of the general population, or of a certain age or occupational group, during a period in the flow of time are of much greater value than a fragmentary cross-section disease canvass at a given point in time.

These former studies are, however, more cumbersome and costly and can only be pursued on a comparatively small scale in selected localities.

Immense reservoirs of data on morbidity are available and close at hand in the files of hospitals and dispensaries, and to a minor extent in the offices of visiting nurse associations, all over the country. Our official and unofficial health agencies also possess a wealth of information concerning infectious and other reportable diseases, and our health and educational authorities have gathered mountains of records concerning certain ailments of school child life. Unfortunately, the school medical inspection crop of figures is rarely analyzed in the various relationships to child growth and social or environmental phenomena to which it lends itself. An effort was made to ascertain what proportion of the average annual absence of a child from school is due to illness but it was found that this information was not available, at least so far as New York City was concerned. The same criticism of the unavailability of our statistics very often applies to recorded data in health departments and in special and general hospitals.

Very few of the general hospitals publish their medical and surgical experience. The annual reports of the hospitals are, as a rule, published for the information of the lay contributors and the presentation of the medical data is considered a sheer waste of space, effort and money. The hospitals which publish detailed medical statistics do not invariably follow the same nomenclature; do not tabulate the complicating conditions; and do not follow the same method of tabulation—thus the attempt to combine the data of several hospitals is not so easy a matter as it may seem. The much more extensive material bearing on morbidity—that of the out-patient departments—is seldom, if ever, presented in any detail. Considering that in New York City alone about 400,000 patients go through the hospitals annually and over 1,000,000 consult the dispensaries and out-patient departments, one realizes the enormity of available morbidity material, if it were only organized and brought together.

The creation of a machinery for the collection and organization of the huge mass of hospital and dispensary records is one of the most important steps toward obtaining reliable morbidity statistics. In 1913, Charles F. Bolduan [3] presented a practical plan of gathering hospital statistics and suggested that the health department of the city be made the repository of the brief records concerning each patient to be supplied by the hospitals, the name of the patient not being given. The plan was not tried until 1923 when the Hospital Information Bureau of the United Hospital Fund of New York made an arrangement with six general hospitals to make the experiment for a year or two.[4] The suggested method of Bolduan has been found to be entirely practicable, comparatively inexpensive and not too onerous to the individual hospitals. Considering that under a plan of this kind, the coöperating hospitals are saved the trouble of tabulating their own statistics and can, if they choose, compare their experience with that of other hospitals, the expense involved in the extra clerical work and the pro-rata share of maintainjng a central statistical office is well repaid. It goes without saying that the more hospitals that join the statistical pool, the less is the cost per unit of statistical service. It will require a great deal of persuasion to develop and extend this experiment in statistical coöperation. It should not be limited to hospital experience proper but include extensive material of the out-patient department.

It is our opinion that this work should be done on a national scale and under the auspices of either a governmental agency like the United States Public Health Service or professional bodies like the American Medical Association, the American College of Surgeons, the American

Hospital Association, or the American Public Health Association, singly or jointly. It could perhaps be attempted at first by individual states under the auspices of either the state department of health or the state board of charities. It would probably be better to establish the necessary machinery under some national rather than local auspices. At first only an institution here and there will agree to coöperate, and the broader the area covered the more valuable the data will be and the more institutions will participate. In his address before the American College of Surgeons in 1920, William J. Mayo stressed the point of the importance of the study of morbidity data as a mass phenomenon. He stated: "In order to secure a perspective which will not be distorted by minutiæ the mass rather than the details should be considered." [5]

As an illustration of some of the data obtained from the experience of six general New York hospitals, the following table is submitted.

The table gives the percentage distribution of the principal groups of diseases for the 14,291 patients, 15 years of age or over, who were treated in six general hospitals in New York during 1923. It also gives the percentage distribution of the same groups of diseases among the patients as divided into 4 general groups on the basis of occupation affiliations. It will be observed from the table that the diseases of the digestive system contribute the largest share toward recruiting hospital patients. The diseases described in the International Classification as "General," which include the various epidemic and infectious diseases as well as such diseases as cancer, are responsible for the second largest group of hospital patients. The other diseases occur in the following descending order: diseases of the genito-urinary system, including puerperal conditions; diseases of the circulatory system; diseases of the respiratory system; and diseases of the nervous system.

This order of frequency distribution is somewhat changed in the several groups of patients. Among the out-door workers the respiratory diseases occupy the third place, while these are the fifth in order of relative importance among the in-door workers; and then while in the out-door group, heart and circulatory diseases hold the third place, they are one rung lower on the ladder measuring their relative position among in-door workers. In the housewife group, the order is entirely different. After the troubles of digestion come gynecological conditions, followed by "general diseases," and those of the circulatory system, nervous and respiratory in the order named. The unoccupied group has an order of its own, owing probably to the fact that it is composed in almost equal proportions of males and females and has of all groups the highest proportions of those under 19 and over 60.

Details are not discussed here of the many tabulations which were made on the basis of the data from the six general hospitals which supplied the Hospital Information Bureau of the United Hos-

COMPARISON OF PERCENTAGE DISTRIBUTION OF THE PRINCIPAL DISEASE GROUPS* AMONG THE SEVERAL OCCUPATIONAL CLASSES

Diseases	All patients (15 yrs. old and over) Per cent	Out-door Workers Per cent	In-door Workers Per cent	Housewives Per cent	Unoccupied Patients Per cent
General Diseases:					
Epidemic, Endemic and Infectious	4.6	8.1	6.6	2.4	4.2
Not included above	10.0	12.8	11.9	8.0	11.0
Diseases of the Nervous System	4.7	4.8	6.0	2.9	8.2
Diseases of the Circulatory System	7.0	7.8	9.2	4.3	11.0
Diseases of the Respiratory System	5.1	8.6	6.8	2.9	6.4
Diseases of the Digestive System	25.0	21.9	35.6	14.7	36.4
Diseases of the Genito-Urinary System	10.8	4.4	8.4	13.9	10.1
Diseases of the Skin	1.5	3.2	2.3	.6	1.6
Diseases of the Bones	1.5	2.7	1.9	.9	1.9
Ill defined, not stated, etc.	1.1	1.4	1.4	1.0	.4

* Puerperal conditions and non-occupational accidents were omitted from this table.

pital Fund with copies of discharge certificates of all patients during 1923. The tables will be published in appropriate journals in the near future. The above figures are used merely to illustrate the prevailing relative proportions of diseases treated in our general hospitals. A larger experience may lead, among other questions, to the consideration, as to whether or not there exists a nice adjustment between the utilization of hospital facilities and the present sickness prevalence in the community.

It will be of interest in this connection that eleven of the most important obstetrical services in New York City have asked the Hospital Information Bureau to act as a repository of information concerning those phases of obstetrical experience which pertain to stillbirths, prematurity, and infant deaths.* Partial analyses of this type are likely to lead to valuable results in the realms of morbidity statistics as well as of medical and surgical procedure.

SUMMARY

1. Morbidity statistics are an indispensable guide to intelligent public health administration, social engineering and legislation, and the planning of community provision for the acutely ill, the convalescents, and the chronics.

2. Aside from information concerning the incidence of certain infectious diseases, the experience of some accident and sickness insurance funds, and the casual local canvasses, we possess no adequate information concerning morbidity in this country.

3. Only twice has an attempt been made to take stock of the prevalence of disabling illness in the United States, namely, in the federal censuses of 1880 and 1890. The census authorities should be urged to resume decennially the collection of morbidity statistics.

4. The vast stores of data buried in the files of hospitals and dispensaries are rarely made available, and until the experiment of coöperative statistical service was undertaken by the Hospital Information Bureau of the United Hospital Fund of New York, no efforts of "pooling" the statistical experience of hospitals was ever attempted. From the point of view of the common sickness phenomena *en masse*, the experience of out-patient departments and dispensaries is even more valuable than of the hospitals proper.

5. The organization of a service for the systematic assembling of hospital experience should be undertaken either by the United States Public Health Service or under the individual or joint auspices of private organizations like the American Medical Association, the American College of Surgeons, the American Hospital Association, or the American Public Health Association. The data from the out-patient departments should be made part and parcel of this statistical material.

6. The recent intensive study of sickness prevalence carried out by the United States Public Health Service at Hagerstown, Md., corroborates in a very instructive way the similar, though less intensive, study made earlier by the Public Health Committee of the New York Academy of Medicine in New York City, and points to the need of periodic studies of this character to be made in various sections of the country.

7. Active steps in the promotion of the movement for adequate morbidity statistics in this country should be taken by the officers and the Executive Board of the American Public Health Association.

* Samples of the schedule used for this purpose may be obtained from the author, 17 West 43d Street, New York City.

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SCHOOL HEALTH EXAMINATIONS*

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THE OLDER TEXT-BOOKS on the health of the school child are replete with discussions of school examinations, how they shall be given and by whom. Recently there has been a great deal of talk concerning standardization of various phases of health work. Certain portions of the health program doubtless can and should be standardized but we believe that the school health examination does not lend itself to too rigid standardization. Each of the various types of examination may be best suited to some particular set of conditions.

The examination itself is useless except as a means to an end, and in any discussion of the subject we must constantly bear in mind the object of all school health work—healthy children. Keeping healthy children constantly before us as the beacon light towards which we are steering, it is then possible to discuss the effectiveness of various types of examinations in attaining this goal. This emphasis upon the object of the program, which is perfectly obvious to all of us, would seem entirely unnecessary were it not for the fact that we often find ourselves so engrossed in evolving a method of examining that we fail to evaluate that method in terms of eventual benefit to the child.

Successful school health examinations should result in:

1. Having remediable conditions corrected.
2. Impressing the children and parents with the worth of complete physical examinations.
3. Convincing both children and parents that the advice given as a result of the examination is worth following.
4. Placing children with uncorrectable defects in special classes, such as conservation of vision classes, classes for the hard of hearing, etc.

To restate these points a little more clearly: the system of examination and follow-up work, for the two cannot be divorced, should convince both children and parents that good health pays and that it is obtained or retained only by periodic complete medical examinations and following the physician's advice.

Assuming that the generally accepted follow-up system by nurses obtains, and bearing in mind the desired results, we are in a position to discuss the effectiveness of various types of school health examinations.

The discussion which follows is based upon the type of community and the kind of examination which under ordinary circumstances would be feasible for that community.

Starting with the one room country schoolhouse so isolated as to make impracticable the employment of either a physician or nurse, we find the teacher the sole solution of the problem. What can she do to improve the health of her children? She can and should teach health habits. By weighing and measuring the children she can create an interest in diet and other health habits. If she does not already know, she can easily find out how to test for vision and hearing.

If the teacher be especially ambitious she may learn, either from the nearest well organized health department or from some practicing physician, something about the various other physical defects of school children—tonsils, teeth, mouth breathing, and thyroid, and how to look for beginning symptoms of the more

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 21, 1925.

common communicable diseases. She is then in a position to perform a little more extensive health inspection of her pupils and to talk to them about consulting the physician. She may find it feasible to invite the parents to the school where she can talk directly to them. The teacher should be careful not to recommend any definite treatment or corrective action, but should confine her attention to impressing upon the parents the advisability of consulting the physician. While such a program is by no means ideal it is infinitely better than nothing and oftentimes does produce noteworthy results. The results will, of course, depend chiefly upon the personality and resourcefulness of the teacher.

If this schoolhouse happens to be in a district reached by the medical inspectors of the state or county board of health, the effectiveness of the program will be increased materially. This aid need not and should not interfere with the teacher's program as it has been outlined, for it is still upon her that we must rely for inculcating adequate health habits and impressing upon her pupils the need for corrective measures. Even if medical examinations are made later the preliminary "screening" inspection of the teacher is valuable in that it has caused her to think of the correlation between physical conditions and mental development and has forcibly impressed her with the necessity of correcting physical defects. Nowhere is the old adage "seeing is believing" more applicable than in the experience the teacher gains in inspecting her pupils.

In a somewhat larger community in which it is possible to employ a school nurse but not a physician, the nurse may well become the captain of the school health team with the teacher as an able and very important assistant. The nurse should be responsible for excluding children with suspicious communicable conditions and make the home calls which are so necessary to bring about the correction of physical defects. She can and should assist the teacher in making health inspections of the children, acting in the rôle of instructor rather than taking over the entire responsibility of the work. With the presence of the nurse it may prove feasible to hold a clinic at which cuts, bruises, and minor skin conditions can be cared for and where children who have been absent from school on account of illness may be seen before being readmitted to the classroom.

What shall be the type of examination in the larger community in which it is possible to secure the services of both physician and nurse? Where there are one or more physicians capable of giving real examinations, the type to be chosen will be that which will result in the betterment of the greatest number of children. A careful analysis of local conditions is necessary before an intelligent choice may be made. If the community is one in which medical facilities are limited both in numbers of private physicians and in clinics, and the number of children to be reached is not so great as to prohibit its use, a thorough, careful examination with recommendations for definite treatment or correction will probably be the type chosen. If the school population is too large for all the children to be reached in this manner we may still retain the careful diagnostic examination and adopt one of the following methods:

1. Limit the examination annually to certain groups such as the underweights, first and fifth grades.
2. Enlist the aid of the teacher or nurse or both in performing health inspections of their pupils, referring for a medical examination those who seem most in need of one.

The only other alternative would seem to be to conduct a more hurried examination covering all the points included in the more careful examination but making it less diagnostic in character and referring the child who appeared to need medical attention to the private physician for definite diagnosis. Whether or not this attitude will prove feasible will depend largely upon how long the school inspec-

tion program has been existent and how well the parents have been impressed with the value of complete medical examinations. If the majority of parents are acquainted with the worth of such examinations, the mere request that they seek the advice of the family physician will probably be sufficient to produce results; if on the other hand the school inspection program is new or comparatively new, the more careful diagnostic examination with recommendations for definite action is desirable. The percentage of indigent parents is another point to be considered in making a choice. In general, the greater the percentage of indigent parents the greater the need for a careful diagnostic examination, especially if free clinical facilities are meager.

In the community having adequate medical facilities, both private physicians and clinics, and where the school inspection program has been in existence long enough to have impressed a fair percentage of the parents with the worth of complete medical examinations, we believe the more hurried or better stated, non-diagnostic or preliminary examination, will produce the most satisfactory results for the following reasons:

1. It puts the responsibility for definite diagnosis and recommendation for corrective action in the hands of the private physician where it belongs.
2. It reaches a larger number of children than the diagnostic examination.
3. It does not antagonize the private physician by contradicting anything which he may previously have said concerning the child's condition or any recommendation which he may see fit to make afterwards.
4. It serves to bring the private physician into closer relationship with the family.

In differentiating between the careful diagnostic and the non-diagnostic or preliminary examination it may be said that the preliminary examination is just as comprehensive as the other as far as points covered are concerned, tonsils, teeth, thyroid, heart, lungs, etc., but less time is spent upon each individual point because time is not taken to make a definite diagnosis or to recommend specific action. For example, instead of saying that Johnnie's tonsils are infected and must be taken out, his mother is told that it would be advisable to consult the family physician about his throat, as the family physician, being more familiar with the child's history, will be better able to judge of what corrective action, if any, is needed.

If the school population is so large, notwithstanding the adoption of the non-diagnostic type of examination, as to permit of but certain special groups being reached, the preliminary health inspection of the pupils by the teachers may prove of considerable value in enabling the physicians to reach a larger percentage of children who seem most in need of attention.

It will be noted that throughout this paper the importance of the teacher as an aid in school health examinations has been stressed. This has been done not solely on account of the help which she can render the physician in sorting out for his attention those children who seem most in need of examination, but chiefly because we are firmly of the belief that the teacher becomes a better and more intelligent teacher for having participated in these health inspections. In most cities, at least as far as the grade schools are concerned, the teacher has been made responsible for the teaching of health habits. Will not this subject be taught more intelligently and interestingly by the teacher who has had the opportunity of seeing at first hand and studying the physical conditions existing among the pupils whom she is to instruct? In many states the teachers are, by law, made responsible for weighing and measuring their children and for testing them for vision and hearing. At least two states, West Virginia and Oregon, have passed laws requiring a more comprehensive inspection by the teacher. Other communities have tried the teacher-inspection plan on a purely voluntary basis.

Detroit is at present entering upon its fifth year of the voluntary teacher-inspection program. Starting 5 years ago with the principals and teachers of 5 schools volunteering to perform complete inspections of their pupils, the plan has grown in favor by leaps and bounds. The second year 15 schools volunteered, the following year 68 schools undertook the work, and last year the program was carried on in 117 schools, covering the inspection of over 100,000 pupils. This year it is safe to say that the plan will be practically universal throughout the public school system. The growth of the system in Detroit seems to argue well as to its mechanical feasibility and its popularity.

Since the teacher as a possible aid in school health examinations is receiving rather widespread attention, a few words concerning Detroit's experience may not be out of place. At the beginning of the school year representatives of the Board of Education and the Department of Health meet with the school principals and very briefly review the work of the preceding year. Principals are asked to send in the names of schools wishing to participate in the work for the coming year. Having obtained this list, arrangements are made with the individual schools for lectures and demonstrations of methods of inspection. All teachers are supplied with copies of a pamphlet of "Instructions to Teachers on the Health Inspection of School Children," at least a week in advance of the date set for lecture and demonstration. Teachers are asked to study the pamphlet and to inspect 3 or 4 of their pupils with the idea of formulating questions to be asked at the demonstration. The pamphlet in addition to discussing the individual points for which inspection is asked contains cuts of a few of the more important physical defects and describes the code of symbols to be used in marking. The code is the same as that used by the physicians.

The lecture consists of a short 10 or 15 minutes talk, given by a member of the school department, pointing out the educational advantages of the program, followed by a demonstration of methods of inspecting given by one of the physicians from the Department of Health. The demonstration lasts about an hour. Children are, of course, used for purposes of demonstration. Teachers are asked to come forward and try the method which has just been described. This enables the physician to point out the correctness or incorrectness of the teacher's technique. Obviously, the smaller the group of teachers the better the results. The points for which inspection is asked include tonsils, mouth breathing, teeth, skin, anemia, thyroid, cervical glands and orthopedic conditions; in fact everything for which medical examination is asked except heart, lungs and nervous conditions, and even here the teacher is requested to make note of any condition which she knows or suspects. The inspection by the teachers is usually completed within a week of the demonstration and the physicians visit the school as soon thereafter as possible to examine those children whom the teachers have referred to them as possibly having defects.

What have been the results of the system? Its very rapid voluntary acceptance is perhaps one of the strongest arguments in its favor. Without any increase in medical personnel the number of physical defects brought to light by the school medical inspectors has increased from 46,006 in 1921 when only 5 schools were included in the teacher health inspection program, to 81,155 in 1924 when 117 schools were included. This would seem to indicate that we were reaching a larger percentage of children who were most in need of examination.

While the teachers are instructed not to discuss physical conditions with the children or parents until after the medical examiners have had a chance to pass upon the children referred to them they may, of course, thereafter use every effort to have physical defects corrected. In this very important phase of the work the teacher may be of inestimable value, for her ad-

vice often carries more weight than the advice of either physician or nurse.

Complete figures are not available, but in certain schools in which the teachers have been engaged in this work for two or more years, the correction of physical defects has nearly trebled. While it may truthfully be argued that the teacher always has the right to urge the correction of physical defects, regardless of whether or not she has participated in the inspection, we are firmly convinced that she does so with much more vigor, enthusiasm, and purposefulness after she has herself performed the preliminary inspection. We know of one instance in which the correction of 42 physical defects was obtained through the personal effort of one teacher simply because she had actually seen the defects for which she was urging correction.

Then there is the benefit which accrues to the child as a result of the teacher being better able to understand and diagnose any lack of progress. She now understands that Johnnie's frequent attacks of tonsilitis are due to infected tonsils and that this may be the cause of his poor showing in school. She knows that Tommy's failure to sit up properly, for which she has constantly been scolding him, is due to an orthopedic condition which can be corrected.

One point which has not been discussed is the correctness or incorrectness of the teacher's findings. She does make mistakes—a good many of them—but on the other hand she does find the more important physical defects, except heart and lungs, for the examination of which the physician must always be responsible, and does refer to the physician the majority of the children who are most in need of attention. Even if the teacher is incorrect in many of her findings, is not the system still well worth while if it results in revealing a larger number of defects needing attention and brings about a greater percentage of corrections of these defects?

Please do not misunderstand the object of this paper. We hold no brief for the universal acceptance of the teacher health inspection program or for that matter of any other type of examination or combination of types, but we do feel that each type or combination of types may be suitable under certain conditions, and we do believe that full advantage should be taken of the teacher's part in school health work.

As far as this paper is concerned, the discussion of the type of examination which might be suitable to a given municipality with a definite set of conditions is based upon the assumption that the ideal towards which we are striving is an annual complete medical examination for each child. We may go a step farther and say that annual complete medical examinations by private physicians for all those who can afford it and free examination by public agencies for the indigent is the ideal goal.

Our attitude in Detroit towards school health examinations is that they are being given as a means of demonstrating their worth and thus creating a demand for that type of service which we know is productive of lasting benefit—annual complete medical examinations by private physicians. It is to be hoped that eventually school medical examinations will not be necessary, except as a means of checking progress, or for those who cannot afford the examination privately.

As a means of increasing the number of examinations by private physicians this year in Detroit, we have sent letters to the parents of all school children advising such an examination and pointing out its advantages over the routine school examination and stating that blanks properly filled out by private physicians would be accepted in lieu of the school examination. The program has been discussed and approved by the local medical society and letters of explanation enclosing physical examination blanks have been sent to all physicians. While we do not expect any very large percentage of parents to immediately avail themselves of the op-

portunity, the response has already been sufficient to be decidedly encouraging.

Summarizing, we believe that:

1. Annual complete medical examinations by private physicians is the goal towards which school health examinations should strive.

2. There is no single type of examination that is equally suitable for all communities.

3. In choosing a type of examination we must evaluate the various possible methods in terms of results which may be accomplished under local conditions.

4. Each type of examination may prove suitable under certain conditions.

5. The use of the teacher as an aid in school health work, including the health examination, should be actively encouraged.

THE UNIFICATION OF MILK CONTROL IN THE UNITED STATES*

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MILK CONTROL in the United States is now in a chaotic, non-uniform state. There can be no doubt that there is at present very little evidence of a singleness of method on the part of health officers in the solution of the milk sanitation problem. The great diversity of method is closely reflected in the differences in legislation. A scrutiny of the ordinances now in force discloses both differences in type and in detail.

The types of legislation now in use include:

1. Ordinances which require all milk to be pasteurized, but which do not make any specifications as to the quality of milk to be pasteurized.

2. Ordinances which specify the kind of milk which is to be pasteurized and the temperature and holding time of pasteurization, but which fail to specify the equipment and operation details of the pasteurization plant itself.

3. Ordinances which do not even mention pasteurization.

4. Ordinances which permit the sale of one grade of raw milk and one grade of pasteurized milk and which have high minimum standards for each of these two grades, but which it is found impossible to enforce because of the resultant danger of a milk shortage.

5. Ordinances which permit the sale of one grade of raw milk and one grade of pasteurized milk, and which prescribe relatively low minimum standards in order to admit the major portion of the milk supply, but which fail to provide for official recognition of the dairy which wishes to market milk above these low minimum standards.

6. Ordinances which provide for several grades each of pasteurized milk and raw milk.

As to the detailed requirements:

1. There is a great variety of bacterial limits for the highest grade of milk legally recognized, such as: 10,000, 20,000, 30,000, 50,000, 60,000 100,000, 200,000, 1,000,000.

2. There is a great variety of temperature requirements at the dairy farm, such as: 45°, 50°, 55°, 60°, 65°, 70°, 75° F., and many ordinances with no requirement whatever.

3. There is much variation in sterilization requirements at the farm. Some ordinances permit only steam sterilization. Some permit hot water but not chemicals. Some permit chemicals. Some make no requirements.

* Read before the Sanitary Engineering Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 22, 1925.

4. There is a great variety of requirements as to the health of employes. Some ordinances make no requirement; some require that the employes be free from communicable disease, but specify no examination; some require physical examination but include no laboratory test; some include laboratory tests but do not include examinations for the typhoid carrier status.

5. There is a great diversity of requirement as to type of barn and milk room floor, distance of the milk room from the barn, lighting, air space, etc.

6. Some ordinances require tuberculin testing of all cows, some for certain grades of milk only.

7. Some ordinances require a pasteurization temperature of 140°, some 142°, some 143°, some 145° F.

8. Some ordinances require a holding time of 20 minutes, and some of 30 minutes.

This detail is given so that one may be left with no doubt as to the truth of the statement that there is little unity of thought in the present status of milk control.

This has resulted in a low "sanitation morale" on the part of the dairy industry. It is easy to understand that such a lack of agreement among health officers causes the dairy industry to distrust the health officers' knowledge in matters of milk sanitation. The dairymen, who move about the country more than is generally believed, discuss these great variations in practice and naturally come to feel that among so many different practices some must be wrong for they cannot all be sound. Therefore, it must be that the knowledge of many health officers in matters of milk sanitation is unsound and that possibly the milk ordinance written by their own health officer and by means of which he is attempting to force them to comply with certain disputed requirements, is not based upon sound reasoning.

Hence, we should not feel too harshly toward the dairy industry if as a result of this state of affairs a spirit of resistance to milk ordinances has developed. Many a health officer distractedly wonders why his milk sanitation problem is one of his most vexing ones, why he is constantly beset with violations, court cases, and all too frequently unfavorable court decisions. Occasionally, of course, it is his personality or the personality of his inspector which is at fault, but fundamentally in most cases it is believed that the fault lies in this feeling on the part of dairymen that the man who is officially in a position to dictate their methods is not qualified to do so either by his knowledge or by his experience, that his requirements are not the requirements dictated by group judgment, but are requirements conceived by himself personally and vastly different from many other requirements on the same subject by other health officers.

It must be admitted then that the "law obedience morale" of the dairy industry is low in many cities and that the fault lies not entirely with the industry.

This lack of unity of thought in matters of milk control has also resulted in a lack of confidence in milk quality on the part of the milk consumer. The most intelligent milk consumer does not always trust the general market milk in his city. Even though he sees reports in the press that the health officer is forcing the dairy industry to obey the local milk ordinance, he consults his pediatrician and is only too often advised that the general milk supply permitted to be sold by the health officer is not a proper or safe infant food and that he should purchase a "certified" milk, the production of which is usually not controlled by the health department at all but by an outside group of physicians known as the "Medical Milk Commission." In other words, this means that the physician has not trusted the health officer's control of the milk supply problem but has instead set up his own separate control board in order to foster special parts of the supply which he can feel safe in approving.

Why has the pediatrician come to distrust the health officer's control of milk supply in so many cases? It seems reasonable to believe that the pediatrician has followed somewhat the same reasoning as has the dairyman.

So we have a situation in which the health officer commands the respect of neither the producer on the one hand nor the consumer on the other. No situation could be better calculated to retard high grade milk production and adequate milk consumption.

It would seem that the wisest solution of this vexing problem would be for health officers to adopt as standard some one effective type of milk legislation and control. If instead of the present situation it were true that the majority of cities in the United States were following some one effective standard ordinance and some one method, it is believed that the dairy industry would soon regain its respect for the health officer and that the confidence of the pediatrician and the general consumer would then be justified and soon awakened. Is this possible? Surely what we have learned about milk sanitation can be embodied in some one ordinance, and surely most of us can then agree upon this ordinance and act in a concerted manner which will invite success.

Tendencies toward agreement among health officers have been observed during the past ten years. Certain states have adopted "model" ordinances. That it is possible to bring about agreement among health officers is foreshadowed by certain tendencies during the past ten years. Within that time a number of states have adopted "model" or "standard" ordinances and many of their cities have enacted these instruments into law. Much good has thus been accomplished in local state areas. In some states many cities which previously were exercising little or no control of their milk sanitation problem have, through the impetus of such a state model ordinance, achieved a high degree of milk sanitation.

However, unless the milk control thought of the states of the country is unified just as several of them have unified the milk control thought of their cities, we shall merely have advanced from a condition of chaos among city ordinances to a condition of chaos among state standards. It would be unfortunate to permit the growing practice of different state standard ordinances to become set and difficult to unravel. It would seem undeniable that now, when the tendency is just beginning, is the time to mature the plan of a state standard into the better plan of a national standard.

A tendency to unify state standard ordinances has been apparent during the past two years. Prior to 1923 no two states had the same standard ordinances or were following any one state-wide milk control program. Since 1923, 9 different states have adopted one standard milk ordinance and one state-wide milk control plan recommended by the United States Public Health Service. These states are now encouraging the passage of the ordinance by their cities and within the short time of 2 years 64 cities have enacted the one ordinance into law.

There is apparent, then, a tendency toward one state standard. Another step forward, which may possibly lead to the adoption of one federal standard, is the action last June of the Conference of State Health Officers with the Surgeon General of the United States Public Health Service in creating a committee to consider the possibility of reaching a common ground in the matter of milk control in the several states.

It is obvious, however, that no standard should be adopted which would be so inflexible as to retard progress. Any national standard ordinance which is adopted should be a progressive one and subject to change, after mature and joint deliberation by the various states. For this reason, it was suggested at the Conference of State and Territorial Health Officers in June last year that the conference devote part of its attention to a con-

sideration of any modification of the Standard Ordinance which might have been proposed since the previous year, and that to these conferences there should be invited representatives of the Dairy Division of the U. S. Department of Agriculture, representatives of the dairy divisions of the various state colleges of agriculture, and representatives of the various national dairy associations, such as the National Dairy Council and the International Milk Dealers' Association.

Such a broad handling of the problem should result in a feeling of fellowship between the health authorities, the Department of Agriculture authorities, the various agricultural colleges, and the dairy industry. Such a plan will also secure for itself the maximum assurance of theoretical soundness and practical workability.

In closing, it is believed that the adoption of some such plan of unification as is outlined above would have the following advantages:

1. Milk legislation will have greater legal strength and dignity. The ordinance will then not be discounted as an invention of the local health officer but will instead be respected as a common practice in cities in general.
2. Dairymen will obey milk legislation more willingly and the difficulties of enforcement will be lessened.
3. Consumers will have greater confidence in milk quality and will drink more milk.
4. The average quality of milk will be improved. A standard ordinance upon which the majority of health officers agree will tend to give results superior to the present confused state of legislation.

POINT OF VIEW OF THE CITY HEALTH OFFICER*

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THE COMBINED IDEALS that have resulted from the experiences of many years in health promotion may be expressed by the slogan "Every home a health center." A review of the steps that have led up to this ideal will disclose that it is best reached through a generalized nursing service as compared with a specialized plan.

ORGANIZATION

To secure a centralized nursing service there must be an ideal of service to the public paramount to selfish interests of official or unofficial health workers.

Three things are barriers to a centralized service; in many communities insurmountable barriers:

1. Too much politics in the official health organization.
2. Jealousies on the part of members of control boards of unofficial organizations.
3. Desire to provide jobs for certain persons, which desire is paramount to interest in public service.

In many communities in order to secure proper coördination of nursing interests it requires a public calamity like the great 1913 flood in Dayton, an earthquake, a fire, a pestilence, or some other calamity that awakens the public conscience and centers attention upon the public need as opposed to selfish ends.

* Read at the Joint Session of the Public Health Administration and Public Health Nursing Sections of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 19, 1925.

The barriers having been removed, it is a simple matter to organize a general nursing control board, with all the different interests represented. The largest nursing organization, usually the Visiting Nurses Association, should be given immediate supervision of the nursing service. Other organizations contribute funds for salaries, rent, clinic service, medical service, etc. The general board provides for systematizing or equalizing contributions, sets salaries, and outlines general policies just as is done by the board of directors of an industrial corporation.

By this system it is possible for coöperating organizations to keep their identity in the matter of securing funds, and thus the prestige of all the associated bodies is brought into united benefit.

ADVANTAGES

The advantages of this plan of service are:

1. Reduced overhead. This means reducing office expense and eliminating overlapping service in the field. In modern business organizations, that one which can give the most service with the least overhead always has the advantage. In spending public moneys there should be the same attention to business details as in operating private enterprises. In fact, the new note in public service is "Economy." By reducing overhead and thus increasing field service, at least 25 per cent of costs can be saved.

In health work it must ever be borne in mind that office work, statistical work and other overhead are but aids and not ends for which to aim. Field service alone is the phase of work that really produces results.

2. Reduced size of the districts which individual nurses must cover. This leads to—

3. The nurse becomes better acquainted with family needs in her district. She is brought into closer contact with the family life, which gives her an opportunity to gain the confidence of the mother and thus to become better acquainted with the family health problems. This can be illustrated by an extract from a district nurse's report.

> Miss S. in District 6 where the families are nearly all Hungarian was asked by a neighbor to visit Mrs. B., who was pregnant. Upon making the call she found besides the expectant mother, Johnny, aged 2 years, not walking, very thin and anemic looking; Mary, aged 6 years, a cripple as the result of infantile paralysis; Mr. B., coughing, complaining of tiredness and only able to work three days a week. Mrs. B. had decided to have a midwife for the confinement but after repeated visits by the nurse finally consented to hospital care. So arrangements were made through the prenatal clinic. Mr. B. was sent to the tuberculosis clinic where a diagnosis was made, and he was admitted to the sanatorium; Johnny was taken by the nurse to the baby clinic, where milk was secured through the Visiting Nurses Association to help the malnutrition condition; Mary was taken to the clinic for crippled children where she received treatments and was sent to the school for crippled children.
>
> The nurse in the meantime had called upon the Associated Charities to put in financial aid. Proper food for the pregnant mother and children was provided while the father was in the sanatorium. When the mother went to the hospital for confinement the children were placed in a boarding house by the Children's Bureau.

It was possible for one nurse to accomplish this splendid work in one family and it was not necessary to refer each individual to other agencies, wasting time and causing duplications.

4. Increased efficiency of service. By being interested in all the health problems of the home, the nurse is able to comprehend mutual or interlocking causes that contribute to different and individual health conditions.

5. Dealing with the family as a unit, which is the unit for all social service.

6. More advantageous coöperation with social service agencies. The nurse, becoming better acquainted with the family health problems is able to make use of information from other agencies, and in turn is able to contribute materially to a

fund of information that is of value to such agencies.

7. The service creates a demand for service. A very important feature of any public health nurse's work is cultivating new fields for service. This can better be done by the nurse who covers a smaller field and whose work is thus better known.

8. Promotes the idea of health education. The modern conception of efficient health promotion is that the most important feature of all health work is education. In all other features of activity, only the present need is looked after. In promoting health education the permanent needs of not only the present generation are taken care of, but provision is being made for safeguarding the health of future generations. By her intimate and comprehensive knowledge of family needs and through the confidence the family have in her, the district nurse is in a particularly advantageous position to impart health knowledge that becomes a permanent part of the family life.

DISCUSSION

The last two decades have been notable for public health development. This development has passed through several stages and is now in what for many years will be a seemingly final stage. Taken as a whole, the first view-point of health promotion was from the standpoint of the community. In this stage of activity the quarantining for contagious diseases and the abatement of nuisances were the chief items of interest. Later there developed the idea of the health center. The health center views health problems from the standpoint of the neighborhood rather than from that of the community. Adapting its work to the peculiar needs of a local neighborhood the health center can minister very effectually to certain health needs.

The next step for health promotion was the realization that, speaking from the health standpoint, the school is the doorstep to the home. The development of this idea has been a potent factor in bringing the health officials, the school, and the home into united action for health promotion. In fact, this idea of activity is yet one of the greatest forces for good in health work.

Taking a step still further, it is now realized that the proper health center should be the home. In the development of this idea in health promotion, the value of the other three has not been lost sight of. But paramount to all these, the fundamental need for health promotion is in the home. The reason this idea will probably remain permanently of first importance is that it includes attention to individual needs. In the home there is the grouping of all disease producing conditions that make up the problems in the school, the neighborhood, and in the entire community. Thus in the home it is possible to meet health problems while in the making, and to solve them before they become school, neighborhood or community problems.

The development of the idea of the home as a health center at once projected the general district nurse into a conspicuous position, as has been noted before. It is she who knows all the details of the health problems in the home. The district nurse not only knows better than anyone else what tendency each member of the family has toward certain defects or diseases, but the most important thing is that, better than anyone else, she knows *why*.

OBJECTIONS

The one real objection to district nursing is the supposedly greater efficiency of the special nurse. It is claimed that one nurse performing but one kind of service becomes more proficient in it.

Realizing that there has been an overspecialization in medicine, the tendency now is to recognize the family doctor as the true basis of medical service, and to use the specialist as an assistant or consultant. Likewise, there has also been

an over-specialization in the nursing field. All the objections along the line as mentioned are successfully met by the well trained field supervisor. Any intelligent nurse, under the supervision of a well trained supervisor, is able to quickly master such details as will make of her an efficient district nurse. In fact, in any nursing organization of considerable size it is a well-known fact that uniform and efficient service depends very materially upon trained field supervision.

CONCLUSION

Finally, one of the most important features of district nursing is frequently overlooked. Any public health work that is associated with an efficient health organization has much advantage. The district plan of nursing brings into united effort the various forces that are supposed to have a common ideal, namely, the promotion of the health of the community.

An important feature in the modern official health organization is a constant survey of the entire health field of the community. By such a survey the health officials are able to command a view-point of health needs that no one else can equal. The health officer who does not know his community's health needs better than any professional investigator can tell him, is not capable. It is thus that association with the official health organization practically doubles the efficiency of the work of unofficial organizations. As the general practitioner knows better than the specialist the general condition of the patient, so by uniting their interests all health workers have a more comprehensive realization of a community's health needs.

In this day when there is an effort to re-glorify the home and to re-establish the old-time respect for its influence in all phases of life, it is important to emphasize the value of health in the home. Any plan or feature that promotes this idea is a great aid in all lines of health work.

The whole discussion of district nursing may thus be briefly summarized. This plan of nursing brings into efficient and united effort all the health forces in a community and more nearly realizes the dream of making of *every* home a health center.

The Failure of Maternity Benefit in Australia—Since July 1, 1913, practically every mother bearing a living child has claimed the $25 baby bonus, but the maternal and infant mortality have remained practically undiminished between 1905 and 1924. In 1913-1914, 64 per cent of the mothers were attended by physicians, and in 1923-1924, 79 per cent, without, however, any diminution in puerperal mortality. The Federal Committee of the British Medical Association suggest as remedies for these conditions the better training in obstetrics of medical students and nurses, the extension of maternity hospitals, antenatal clinics and infant welfare centers, and the provision of help for mothers and expectant mothers in necessitous circumstances. The commissioners recommend that female insured persons and the wives of insured men should receive $5 a week for two weeks before and for four weeks after confinement.—London Letter, *Jour. A. M. A.*, July 18, 1925.

American Student Health Association—The Sixth Annual Meeting will be held at the Astor Hotel in New York City, December 29–30, at the same time as the meeting of the National Collegiate Athletic Association. There will be an interesting dinner conference on the 29th.

RELATION OF PUBLIC HEALTH WORKERS TO INDUSTRIAL HYGIENE *

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IN ENGLAND, as early as the 14th century, legislation existed in respect to workers, but inasmuch as this legislation provided that workers might not move from the district in which they originally lived in order to take advantage of higher remuneration elsewhere, the law was calculated rather to protect the employer than the employe.

Many years prior to the passing of the first Public Health Act in England, factory acts (1802) were passed to protect the health of the worker. So it will be seen that industrial hygiene of a sort antedated sanitary measures in the interest of the general public.

The factory acts of England have for many years been administered by the Home Office, and in the United States and parts of Canada by labor departments. This fact indicates that perhaps labor is in higher favor with governments than is capital.

At the outset most factory acts were limited to precautions respecting sanitation, this being extended later to include certain more strictly medical provisions. The factory acts have usually been administered by lay inspectors with the employment of medical consultants for special medical problems, or by the employment of factory medical inspectors responsible to a lay chief inspector.

The result of this policy has been to end the function of health officials in the protection of the health of industrial workers at the doors of industry. This is unfortunate for the industrial worker as it deprives him of the benefit of trained public health opinion.

There is, however, some evidence of an effort to bring the health of industrial workers into closer relation with general public health activities. This is seen in several activities, such as:

1. The development of divisions of industrial hygiene as sections of departments of health; for example, the City of New York, the State of Ohio, and the Province of Ontario, which attempt to work in close coöperation with the branches dealing with workmen's compensation and factory inspection to solve special medical problems which arise.

2. In Belgium an entirely separate factory medical inspection service has been developed since the war—an outgrowth of provisions which existed previously, but it is now self-contained and administered separately from lay factory inspection, with provision for the proper administrative connections with other agencies touching industrial health.

3. In England a commission which worked during the past year on the question of consolidation of the Factory Act was recommended, among other things, to consider "what measures should be taken for linking up the examination of young persons under the Factory and Workshops Act with their examination under the school medical inspection service and, if considered desirable, with other public health services of the community."

* Read at the Joint Session of the Industrial Hygiene and Public Health Administration Sections of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 22, 1925.

VOLUNTARY ASPECT

The voluntary aspect of industrial hygiene lies in the development of medical service in industry for the supervision of health. This should be done by industry itself and cannot succeed unless industrial executives, employes and physicians appreciate the opportunity and are prepared to work for it. Facilities are necessary to show the industrial groups the need and opportunity which exist in this direction. However, because of the relationships existing in industry which do not obtain in the general community it is most important that the subject should be presented properly. This can only be accomplished by health workers who have studied the situation with its possibilities and are outside the influence of private practice relationships. The main considerations are that private enterprise is being dealt with; that the situation which has developed over a period of years between capital and labor must be recognized; and that *industry constituted as it is, considers economic values of first importance.*

With these things in mind, none but the full-time health officer can accomplish much, and even in his case the subject requires special study before he can expect to avoid the complications which arise from lack of appreciation of industrial relationships and lack of knowledge of industry itself.

It has been maintained that the personnel required to deal with industrial hygiene does not require clinical training and therefore that a new type of health officer should be developed. If industrial hygiene included attention to conditions of work alone this might be the case, but in view of the importance which is attached to supervision of the health of the individual this does not seem reasonable.

The entire question is an additional argument for the establishment of full-time health organization in areas financially able to foot the bill.

Columbia Makes New Appointments in Public Health—The two new positions of Assistant Professor of Epidemiology and Assistant Professor of Industrial Hygiene in Medicine have recently been filled in the Institute of Public Health of the School of Medicine of Columbia University. Alton S. Pope, A.M., M.D., Dr.P.H. (Harvard), on completion of studies on scarlet fever carried out chiefly at Providence, R. I., under the guidance of Dr. Charles V. Chapin, has assumed the duties of Assistant Professor of Epidemiology. Dr. Frank G. Pedley, M.D., Dr.P.H. (Harvard), having resigned as physician at the Cheney Silk Mills at South Manchester, Conn., is the new Assistant Professor of Industrial Hygiene now engaged in the development of an occupational disease class at Vanderbilt Clinic.

These additions to the personnel of the Institute will permit the offering of courses leading to the degrees of Master of Science in Public Health and Ph.D. in Public Health, the only degrees which will be offered by Columbia in this field.

State Charities Aid Association—The New York State Committee on Tuberculosis and Public Health of the State Charities Aid Association will hold its Semi-Annual Meeting this fall by inviting the membership to sit in with the Advisory Council of the Milbank Memorial Fund, when it holds its annual meeting in New York City, November 19 and 20, at the Hotel Biltmore. The New York City Tuberculosis Conference will also be held at the same date and place.

The Advisory Council, composed of the foremost men of America in public health work, will meet to consider the progress of the New York Health Demonstrations in Syracuse, Cattaraugus County, and New York City. The State Committee is the organizing and supervising agency for the Syracuse and Cattaraugus County projects.

SUGGESTIONS FOR SECURING INFORMATION ON ACCIDENTAL DEATHS*

SIDNEY J. WILLIAMS

Director Public Safety Division, National Safety Council, Chicago, Ill.

THE AMERICAN PEOPLE have come to recognize accidents as a major problem, and the only way to attack the problem intelligently is on the basis of accurate information. On industrial fatalities and non-fatal accidents we have fairly accurate and comprehensive information, not only as to the number and rate of accidents in various industries, but as to their causes—or rather let us say the circumstances surrounding their occurrence, for the word "cause" is fraught with so many opportunities for controversy and misunderstanding. But industrial fatalities are only about one-quarter of the total. The other three-quarters are, roughly speaking, automobile fatalities, other public accident fatalities, and home accident fatalities.

For records of public and home accidents we know of only two classes of fact-finding agencies worthy of consideration on any nation-wide basis—the police departments, and the registrars of vital statistics. Accident reporting by most police departments is wofully inadequate, to say the least, and although several cities are now doing excellent work along this line, and we are doing everything possible to encourage others to follow their example, it will probably be many years before anything approaching nation-wide data will be thus available. Therefore, the student of accident prevention other than industrial is compelled to fall back on the data to be gleaned from the vital statistics published by local and state authorities and by the Census Bureau, accepting with regret their serious limitation, these being naturally confined to fatal cases.

But even as to fatalities, what do the census reports tell us? They tell us, for example, that something like 14,000 persons died from accidental falls in 1923. But they do not tell us how many of these people were workmen falling from scaffolds or ladders or into excavations or on a level floor; how many fell down elevator shafts or stairways or otherwise in public or semi-public buildings; how many fell down stairs or off porches or from the family stepladder at home. Without a division into these three general classes, to say nothing of subdivisions, the data as to total fatalities from falls are of very little value for the saving of human life, which after all is the principal justification for keeping any statistics at all. The same may be said of burns, all of which are lumped together without regard to the place or manner of occurrence—the child playing with matches, the adult smoking in his garage, and the employe trapped in a building with inadequate fire exits, are all placed together, although the remedies for these three hazards must be totally different. As for automobile accidents, to take another example, we are not told how many of the victims were pedestrians and how many were drivers or passengers, although this distinction is obviously of the highest importance; much less are we given any inkling as to what the driver and the pedestrian were doing, the con-

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 20, 1925.

dition of the weather, the roadway, light or darkness, in short the circumstances contributing to the occurrence of the accident.

The lack of adequate accident data is not an academic question. Accidents take 85,000 lives per year. Literally thousands of organized groups and probably millions of individuals in this country are giving serious thought to preventive work. Much of this work is wasted because it is founded on assumptions instead of facts. Unquestionably, thousands of lives are being sacrificed annually—this is a conservative statement—because of preventive work misdirected or left undone due to the absence of necessary data.

We, of course, realize the many troubles of the average registrar of vital statistics in securing even the data which the Census Bureau now asks of him, and that he must get his reports from physicians and hospitals, which latter are more interested in caring for injured people than in writing voluminous reports about them. It is not the present aim to tell you what can be done to secure the information which is so badly needed, but only to place our needs before you and then to ask what can be done about it.

The National Safety Council, on the advice of our Statistical Committee (headed by Dr. Louis I. Dublin), has been recommending a 4 x 6 inch card for use by police departments.* The principal items regarding which information is demanded are:

Type of accident—whether collision with pedestrian, with other motor vehicle, etc.
Age of victim
What the driver or drivers were doing
What the pedestrian (if any) was doing
Condition of vehicle
Condition of roadway
Weather
Light
Names, addresses, etc., are of course required for police department purposes.

A card identical with or very similar to this has been officially adopted by the State of New York, the City of Detroit, and about 40 other cities of various sizes, for reporting traffic accidents to the police department. This will indicate to you the sort of facts or circumstances which, in the opinion of the representative committee which prepared it, are of really vital importance and should be reported.

To present the matter in a little different way, we have prepared a mimeographed memorandum * which lists the items which we would like to suggest for consideration, either for possible addition to the standard death certificate or as a supplementary certificate to be filled out in cases of accidental death only. The items on this sheet are self explanatory and we believe their great value for preventive purposes is obvious.

This is respectfully submitted for your consideration, with the hope of receiving your individual or collective answers to these questions:

First, can those of us who are working to reduce our accident toll of 85,000 lives annually hope for any assistance from the registrars of vital statistics in the form of additional data?

Second, if so, what sort of data would it be feasible to secure in this manner?

To this may be added: what are you and what are we going to do about it?

* Samples may be obtained from the author.

SURVEY OF 86 CITIES

HAVEN EMERSON, M.D., FELLOW A.P.H.A.

THE Research Division of the American Child Health Association has just published a report of its survey of cities of 70,000 to 100,000 population.

Diagnosis before treatment—this is the lesson of the latest survey volume. Because the professional leadership of the American Child Health Association was unwilling to plunge into advice and community programs without background, without facts of experience and practice before them, there was a logical demand for the periodic health examination of a lot of presumably healthy American communities.

Here we have case histories of our very neighborly small cities in such abundance that we can catch the features of family resemblances, the points of distinction, the stigmata of retardation and separate the precocious from the mediocre.

This is a splendid source book for teachers and writers, a classroom textbook quite indispensable in departments of sociology as in schools of public health. At an expense of 1 cent apiece, 5,000,000 residents of our typical American urban communities in 31 states could have bought this invaluable analysis of their health services if they had known how to select the leaders, the diagnosticians, the consultants, and other associates with the liberality and discretion shown by the management of the American Child Health Association.

This survey volume of the health status of 86 cities is a precious gift of science and good will offered in a way to the other 105,000,000 Americans, not covered by the survey, who paid generously for the protection of the American child as they paid for those of foreign and less fortunate and prosperous peoples.

Reading as it were the last chapter first, we find nothing exactly dramatic in the outstanding facts.

1. Each city was found to be carrying on some organized effort for bettering the health of children, although the amount on the average is perhaps not over half of what is to be expected in a reasonable health program.

2. By utilizing the scientific knowledge now at hand it is possible by better organization to increase materially the health protection of children at no great increase in cost.

3. The greatest needs are well trained health officers devoting undivided attention to the task, standardization of methods, more thought in explaining health work to the public, and better team work among public and private health agencies.

Restrained, moderate and sincere are these brief paragraphs. They need frequent and insistent repetition in the hearing of elected officials, business organizations, women's clubs and among school teacher and parent groups. The lack of an index is not a shortcoming when we note the excellence of the table of contents and the self-indexing arrangement of the text.

The method of the undertaking discloses at the start the determination to eliminate so far as humanly possible the errors of temperament or personality, of previous experience, and bias in the surveyors.

There follows a good picture of the personality and functions of the cities' health activities and then a generous section of etchings, brief news pictures of each individual town and its health job. The whole is followed by an image of what we may some day see, by no means a mirage but rather a vision of expected accomplishment, a practicable plan for the best work, and a quality we can easily pay for.

We enter, as it were, with the surveyor at the health officer's door, learn his authority and his qualifications, his professional past and his pay, and then travel with him through his day's work, into and out of homes, schools, dairies, laboratories and clinics asking him very pointed questions all the time. He can always answer "yes" or "no" to our queries, and in spite of the limitation this puts upon the completeness of the truth, still it is a method that forbids falsehood in its crude forms.

We are duly shocked but hardly surprised to learn that there are among these cities 28 different procedures by which a diphtheria patient may be released by as many different health officers at the termination of the disease, and 25 varieties for termination of isolation of scarlet fever. We find cities where the death rate

exceeds the birth rate; one might call them moribund communities.

A third of these little democracies still burn incense to unknown gods in the form of gaseous fumigation after the eruptive fevers.

Happily, following the disclosures of each eccentricity or dereliction of service, there comes the recommendation for another and better way of doing the job. These are very wise statements. The recommendations throughout the volume show a rare maturity of view, freedom from fanaticism or bias in any particular type or phase of public health functions. Hobbyists have had no opening in this closely studied structure of municipal health.

We can stand off as on a great opposing hill or take a glance from the passing air-mail and picture each city as we give the "once-over" to a personal patient, noting bulk, features, the identifying marks of government, population, area, the number of souls in the houses, the bornings and dyings in the city.

Then getting down to dots, the specific tests of action, service, use, as proposed in the now classical Appraisal Form, we analyze the functions one by one. These are shown to us in a scholarly and direct manner, with as much detail as is at all profitable either for the city or for the student of professional health practice.

Of special interest is the analysis of health habits among school children, not that the method is novel, but no such range of communities has previously been so well reported.

One looks in vain for any reference to a study of the non-effective rate of school children or the percentage of days lost on account of sickness. There is no other index of results more illuminating than this, the most accurate measure of the combined effects of environment, home, school, parent, teacher, doctor, health officer and schoolmates upon the health performance of the school child.

It is a satisfaction to find that only 18 of the 86 small cities have taken up the almost profitless health hobby of examining food handlers.

While we may believe that everything in spirit, matter and human conduct has a bearing upon health and is within the range of interest of the health officer, still the inclusion of recreation under a health survey when industry or occupational hygiene is not even mentioned, shows the influence of sentiment rather more than sanitation. Let us have play places and play direction by all means for what the ladies call "positive health," but these will be of minor importance until we have put more sound work on the offenses of industry to health.

Housing and zoning also are but slightly touched upon though of major importance in a health picture.

Care of the sick is so closely correlated in personal and community experience with health and its protection, that one almost unconsciously looks for information upon hospitalization, dispensary, convalescent, and other care of the sick both acute and chronic in a health survey. Communities' burdens vary widely in responsibility for their own and their neighbors' diseases and handicapped. We find in this chronicle of health little word of sickness care, except in the case of the acute communicable diseases and for tuberculosis and venereal diseases.

However, a venture is made into the field of general hospital needs which is so far from the estimates made by others as to call for a friendly hesitancy on the reader's part.

Six beds per 1,000 of population in addition to 1 per 1,000 for children and 1 per 1,000 for obstetrics, or a total of 400 beds for what are usually described as general medical and surgical patients is far above normal hospital needs or use in American cities. Since tuberculosis and communicable diseases are accounted for separately, approximately 1 bed per 1,000 population for tuberculosis and 1 per 2,000 for communicable diseases, we can safely say that any normal urban community in the United States will use to 75 per cent of its capacity not more than 250 to 300 beds for all general medical, surgical, obstetrical and pediatric cases requiring hospital care.

One closes the volume with a deep sense of pride in the quality, the sincerity and ability of the profession of public health in the United States. Together with the forthcoming report upon 100 of the larger cities, by the Committee on Municipal Health Department Practice, this survey of the 86 smaller cities will prove as classical as Dr. C. V. Chapin's volume of 1901 on *Municipal Sanitation in the United States*.

No new tricks of management or slogans for campaigns, no panaceas for the public are offered, but solid facts presented with discretion, and discussed with a good sense of proportion, even in the special field of child hygiene where some overemphasis might have been expected and excused.

Congratulations and generous praise to the authors are certain to be the well earned result of this work.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE FIFTY-FOURTH MEETING

THOSE WHO were unfortunate enough to miss the St. Louis meeting have indeed been deprived of a treat. Without making invidious distinctions, it is safe to say that the Association has had no better meeting in many years, both as regards the number in attendance and the papers presented. It is a matter of regret that our sister republics of Mexico and Cuba were not represented. To our great delight, Canada was unusually well represented this year and we trust that the doleful effects of the World War being overcome, she will soon again take her part in the Association in the delightful manner of the old days.

Certain features of the meeting call for special commendation. Among these was the General Session on Monday afternoon in which each one of the sections was represented by a speaker who gave to the audience a review of what in his special field had been accomplished in the past year, work now in progress and plans for the future.

With the growth of the Association and our increasing knowledge of the many factors involved in public health, it has become necessary to establish nine sections in what we may call the specialties. In spite of the fact that for two years past we have had most excellent arrangements for announcing the name of every speaker in every section, so that those interested in special subjects might go from section to section at the proper time, the fact remains that it is impossible for anyone to hear all of the papers desired or those which are of especial interest to him. The summary presented at this General Session was then most useful and will unquestionably serve to draw the different sections closer to each other, and give to our general membership a very much better idea of what the Association is accomplishing by its general activities, its meetings, and through its JOURNAL and other publications.

The second meeting of outstanding importance was that on oyster sanitation. Everyone remembers the outbreak of typhoid fever a year ago which struck a mortal blow at an industry producing fifty million dollars worth of foodstuff per year, and let thousands of men out of employment with the attending impoverishment of their families. The Association years ago established the first standards for oyster inspection and many oyster beds have been controlled by our members in more or less close accordance with these regulations. The symposium on this subject gave the engineering standpoint, the laboratory aspects and a fair amount of the biology of the oyster upon which correct methods for insuring safety must

eventually be based. It will be reassuring to health officers and the public to know that our Public Health Service is coöperating with the oyster producers in a thorough study of the question of the promulgation of regulations which will insure safety to the consumers of this important food. In addition to this, numerous laboratories, chiefly those of municipalities and states, are taking their part in the work. It is to be regretted that Congress up to the present time has not furnished a liberal appropriation for the biological studies upon which so much depends.

We must mention also the dinner session on Tuesday night held under the auspices of the Committee on Standardization of Public Health Training. Approximately 225 people were in attendance, evidence of the increasing interest being shown in this important question. The need for a trained personnel is increasing every year and positions are rapidly opening up as states, municipalities, and business men are realizing the importance of health in the affairs of the world. Many are called but few are chosen.

The Local Committee on Arrangements has served the Association well. St. Louis opened her doors wide to all in attendance. The many beautiful country clubs were at the disposal of those who needed fresh air to clear their brains of the labors of scientific work. Excursions to places of interest were provided for and at the opening General Session in the Ball Room, courteous words of welcome were given by the Governor of the State, and the Mayor of the City, as well as state and local health authorities. After the proceedings were over, the floor was cleared and dancing was indulged in by many of the members and guests. All in all, the 1925 meeting will be memorable to the thousand people who attended.

PATRIOTISM AND COMMON SENSE IN EDUCATION

WE HAVE THE tentative program of the American Educational Week jointly sponsored by the Bureau of Education and the American Legion. For each day from November 16 to November 22 inclusive, some special topic is assigned; programs are given; and slogans for adoption proposed. Patriotism is justly exalted, although one might question some of the statements made, such for example as, "Our Flag insures the sanctity of life and the security of property." When one remembers that we lead the world in murder and crimes of violence against the person as well as property, and that no people in the world punishes so small a percentage of its criminals as we do, we are justified in doubting whether such a statement should be made, much as we believe that the statement should be the truth.

However, the program in which we are particularly interested is that for Community and Health Day, Saturday, November 21. In this program physical education is exalted, and the statement is made: "Physical education means health and strength." We would be the last to decry the value of proper physical education, but there is already too much tendency to look to physical education as a panacea for every ill, and our universities, which are supposed to be centers of learning, spend more money on athletics than they do on many departments of science. Furthermore, it is a question whether physical education does mean health. There are other types of education which we are more certain will bring this result. Health education, for instance, sometimes confused with but in fact quite different from physical education, is a major effort of public health workers and many teachers; yet this program of the Bureau of Education makes no mention

of it. Perhaps the emphasis on physical education is to be credited to the other partner in the enterprise—the American Legion.

Among the slogans for health day are "A square deal for the country boy and girl" and "A sound mind in a sound body." We may well ask why the country boy and girl should have a square deal any more than the urban dweller. Equality in life and a fair distribution of benefits should be the ideal. We cannot help but feel that political considerations as well as pedagogy had a part in determining this program for Educational Week. From the standpoint of education, the reason for the participation of the American Legion is not evident, especially since there are several national unofficial organizations whose direct interest is in the educational field. With the advice of these organizations readily available upon request for the whole program and with similar consultation with the unofficial health organizations upon the program for health day the many shortcomings of the program might have been avoided.

THE JOB AND THE MAN

A RECENT REPORT of the Committee on Full-Time Health Officer Legislation of the Conference of State and Provincial Health Officers indicates substantial progress along this line during the past four years. Vermont, it is true, has slipped backward instead of advancing; the repeal in 1923 of its district health officer law removing this state from its past position of leadership in rural health work.

In Arkansas (1925), Maryland (1922), New York (1922) and Pennsylvania (1925), however, new provisions have been made for the appointment of full-time county health officers and in Alabama, Missouri, Texas and other states appropriations for the development of full-time county service have been substantially increased. Wisconsin reports a new law making compulsory the appointment of full-time health officers in all cities of 25,000 and more inhabitants.

Another very significant illustration of the increasing value placed by American communities upon health service is the appointment of Dr. E. C. Levy as Health Officer of Tampa, Fla., at a salary which is probably the highest ever paid to a city health officer in a city of this size, and it is particularly gratifying that such recognition should have come thus promptly to a man whose devoted and brilliant service to the city of Richmond was recently unceremoniously terminated by a new mayor on political grounds.

We need to apply something like the Tampa salary scale in many other cities of the country—or at least to recognize that the position of health officer calls for training and personal qualifications such as are not required for the ordinary municipal bureau chief and that his salary should be at least commensurate with that paid to the superintendent of schools. We need to realize that the health department like the school system should be placed on such a basis that no politician will dare to treat its expert head as a political appointee.

Yet we are making progress, as the experience of Dr. Levy indicates. In general, it may be confidently asserted that for one man looking for a job in this field there are ten jobs looking for a man. The public has today reached the point where it desires health service and is ready to pay for it with reasonable generosity. It is lack of trained personnel which holds us back on every hand. Not only do we need young medical graduates to enter the field of public health, but we need men and women trained in sanitary engineering, biology, statistics and other of

the sciences contributing to the public health service. Above all we need young people who from the time they leave the preparatory school will plan their studies with a public health career definitely in view. For too long have we been trying to make over people trained primarily for some other work.

Public health workers are in a certain sense salesmen who are urging upon the public the value of a new commodity—health service. They may well devote a part of their energy to the task of keeping the commodity itself up to standard by visiting colleges and schools and doing what they can to recruit the brains needed to carry out great tasks to a successful conclusion.

POLITICS AND PUBLIC HEALTH

THE PRESERVATION of food by chemicals has been a burning question for many years. The war brought about a certain amount of let-down in the regulations. Every country permits the use of certain preservatives such as sugar, salt, saltpeter, vinegar and spices, but for some of these things there is the very potent argument that they are foods, or play some necessary part in the human body.

The Ministry of Health of England now proposes certain restrictions against the use of boron preservatives in certain articles of food. The reasons for this are fairly well known in this country, and it has been a matter of surprise to some of us that England has for a long time permitted the use of preservatives which are outlawed in the United States. There can be no question that the Minister of Health has no ultimate object in view other than the protection of health in the British Isles, but a storm of protest has been raised and appeals have been made not only to the Minister of Health but also to the Prime Minister and the Members of the Cabinet.

Some of the arguments in the protest are curious, to say the least. It is said that there is no demand on the part of the electorate for action of this kind, and no demand from Members of Parliament of any party; that the Conservative Party was put into power on account of the fear of bureaucratic interference with trade and industry, and the action of the department is characterized as wanton, gratuitous, unnecessary, unjustified, and of the kind from which a conservative government might well be asked to protect the country. From the information which comes to us the "liquid egg trade" seems to be the chief point of attack. In other words, the petitioners are anxious to retain the right to use boron compounds in this business, in which apparently a large amount of capital has been invested.

From our standpoint the idea that health has to be regulated by politics is a perverted view. We recognize, of course, that some concessions must be made to industry and that the proper rights of citizens should not be interfered with unnecessarily, but it is a well founded principle that the public health is paramount to private interests. If it be objected that what goes on in England does not concern us, we may point out that what is done in one country is often used as a precedent for other countries, and the fact that a great nation like the English concedes a point is more than apt to influence legislation in this country sooner or later. America is probably the strictest of all countries concerning the use of preservatives in food. The abundance which we enjoy makes us more liberal than the older and more crowded countries and we are apt to discard many things which would be utilized in some other places.

Concerning certain preservatives and their injurious properties, we can speak positively. Concerning others, we are not so well placed. It can be said, however,

that any tendency to let down in our regulations concerning foods is apt to be dangerous, and it is well known that the employment of preservatives enables manufacturers to utilize foodstuffs which, owing to their condition, are in themselves unfit for food.

HENRY ROSE CARTER

1852–1925

IN THE DEATH of Dr. Carter, an honorary Fellow of our Association, preventive medicine has lost one of its brightest stars. He died at his home in Washington, D. C., September 14, after an illness of several months' duration. By a special act of Congress, he held the position of Assistant Surgeon General in the Public Health Service, which he entered on May 5, 1879, and in which he did active service for more than 40 years, going on waiting orders in 1920.

HENRY ROSE CARTER

He was born in Caroline County, Virginia, August 25, 1852, a member of one of the most distinguished families in the United States. He graduated as a civil engineer at the University of Virginia, took special work in mathematics and applied chemistry at the same institution, and studied medicine at the University of Maryland, graduating in 1879. He took a prominent position in the Service on account of his unusual preparation, as well as his ability. His duties at the Ship Island Quarantine Station and in the control of several yellow fever epidemics in the southern states fitted him especially for tropical disease work, and in 1904, when the Americans took charge of the Panama Canal, Dr. Carter was one of the earliest of a small group to proceed to the Canal Zone, where he was director of hospitals for five years. In 1900–01, Dr. Carter, in a brilliant piece of epidemiological study discovered the extrinsic incubation of yellow fever, which will always serve as a model of patient investigation, clear thinking and exact deduction, and placed him high among investigators. While the theories as well as the work of Josiah Nott and Carlos Finlay had pointed to the mosquito as the carrier of yellow fever, the observation of Dr. Carter probably had much to do with Reed's return to that line of study. His name will always be linked with those who brought the final solution to the great problem of yellow fever control.

Dr. Carter instituted the use of flowing steam for disinfection at quarantine stations, also the inspection and disinfection of vessels at ports of departure, which has been designated as "almost the only advance in maritime quarantine since the days of the Venetians." He has justly been called the Father of modern quarantine.

He was a member of numerous societies, a frequent contributor to journals devoted to medicine and hygiene and also wrote chapters for some of the larger systems. He was sent to Central and South America in 1916 as a member of the Rockefeller Commission. In 1917–18 he had charge of the malarial work for the Public Health Service, with special reference to cantonments. In 1920–21 he was sanitary adviser of the Peruvian Government.

While Dr. Carter had a wide knowledge of medicine, his work for a number of years led him particularly to the study of tropical diseases, especially malaria and yellow fever. No one will resent the statement that he was probably the best adviser on malaria and its control and knew more about it than any other man in the United States. He was a staunch advocate of treating the conditions rather than

human beings, saying that he knew what he could do by ditching, with cement, clay, etc., but the human element was uncertain and hard to control.

Dr. Carter showed the breeding of his distinguished family, was always courteous and congenial, though firm in his scientific opinions. He was singularly modest and absolutely free from mercenary motives. His many friends will regret his passing and scientific men the world over will mourn the loss of a distinguished and successful coworker.

EUGENE R. KELLEY

1882–1925

THE JOURNAL regrets to record the sad death of Dr. Eugene R. Kelley, for ten years an official of the State Health Department of Massachusetts and for seven years the Commissioner.

Dr. Kelley was born in Bancroft, Maine, November 5, 1882, and died in Boston September 27, 1925. His collegiate education was at Bowdoin College and his medical degree was taken at Johns Hopkins University in 1906. He had his hospital training at Carney Hospital in South Boston. He was engaged in the practice of medicine for a short time, but his tastes were for public health work in which he took such an active interest that he was shortly made Commissioner of Health of Washington. From Washington, he returned to Massachusetts, entering the service of the State Board of Health as Director of Division of Communicable Diseases from which he was promoted to the office of Commissioner in 1918.

He always took a prominent part in the affairs of the Association. He was liked by everyone and served on important committees including the Governing Council, the Executive Board and the Committee on Municipal Health Department Practice. He leaves a widow and two young children. The Association has passed suitable resolutions recounting its sense of loss which will be sent to his widow. We desire to record here also our appreciation of his life and service and our sense of loss in his death. We extend to his widow our sincerest sympathy.

EUGENE R. KELLEY

LETTER TO THE EDITOR

TO THE EDITOR:

An editorial and review, in the August, 1925, issue of the AMERICAN JOURNAL OF PUBLIC HEALTH, have come to my attention.

Regarding the statement, quoting U. S. P. H. Service *Bulletin No. 147*, that the pasteurization temperature of milk and cream dispensed in Chicago is 140° F., and the holding time 20 minutes, I desire to correct a misstatement.

While our city ordinance calls for the above temperature and holding time, since July, 1916, it has been required that all milk and cream dispensed in Chicago be pasteurized at a temperature of not less than 145° F., maintained for a period of not less than 30 minutes, and this is being strictly adhered to.

At the time this regulation was put into effect our typhoid fever death rate per 100,000 population was 5.1; the typhoid fever death rate per 100,000 population for the year 1924 was 1.53.

I am advised that a statement has been prepared for publication in the *Public Health Reports*, in order to correct the error, and any additional publicity you can give will be greatly appreciated.

Very respectfully,

HERMAN N. BUNDESEN, M.D.

Commissioner of Health,
City of Chicago, Ill.
September 23, 1925.

ASSOCIATION NEWS

THE NEW OFFICERS

On Wednesday, October 21, the Governing Council of the Association elected C.-E. A. Winslow President of the American Public Health Association for 1925–1926. Professor Winslow's numerous activities in public health

C.-E. A. WINSLOW, DR.P.H.

work are too well known to need repetition here. His selection as President comes as fitting recognition of his long and devoted service to the Association. Though he has served on numerous committees during the past few years, he has more recently concentrated his efforts on the Committee on Municipal Health Department Practice, of which committee he has been chairman since its creation in 1920. In this capacity he has labored particularly in the interest of the city health administrators and through this committee there has now been established in the offices of the Association an office with a staff which is at the service of city health officers. Plans are already under way to extend this service also to county health officers. With Professor Winslow's elevation to the Presidency the correlation of the work of the Committee on Administrative Practice (as it is now called) with the work of the executive office is assured, and though all members are happy in this choice, as the applause which greeted the announcement of his election testified, the official health administrators have especial reason for gratification and may now look forward to the Association's being of greater service to them than ever before.

The Association is equally fortunate in its choice of the other officers for the year—Dr. John A. Amyot, Deputy Minister of Health of Canada, elected first Vice-President, has always been a staunch supporter of the Association in Canada. The election of Dr. Max C. Starkloff, Health Officer of St. Louis, as second Vice-President was a fitting recognition for the admirable way in which the Association was entertained in St. Louis, which entertainment was only marred by the absence, due to illness, of Dr. Starkloff himself. Dr. A. J. Chesley, Health Officer of Minnesota, was elected third Vice-President. This honor comes appropriately to Dr. Chesley for his long devotion to the interests of the Association, and it has been regretted by many that the demands of his work in Minnesota prevented him from taking an even more active part. Dr. Dublin was unanimously reëlected as Treasurer.

These officers will represent the Association with distinction and their presence on the Governing Council will give added weight and wisdom to its deliberations.

BUFFALO NEXT

In 1926, after an absence of a quarter of a century, the Association will return to Buffalo, assembling for its Fifty-fifth Annual Meeting. There is every indication, however, that the high standard set at St. Louis will not only be maintained but surpassed. Before leaving St. Louis where the successes and failures of the Fifty-

fourth Annual Meeting were fresh in mind, the chairmen and secretaries of the sections met with the President and Executive Secretary to begin at once the plans for next year. Conferences have already been held with Dr. Fronczak, the Chairman of the Buffalo Local Committee, and a preliminary study of the arrangements has been made in Buffalo. The unusual attractions of this border city, its location with reference to the majority of the membership both in Canada and the United States, and the splendor of Niagara Falls with the new night illumination in color, now considered by many the most beautiful of scenes in America, promises well for an unusually large attendance. Public health workers who plan their schedule of meetings for 1926, omitting the Buffalo meeting in October, 1926, will miss a meeting that has for long been and promises to continue to be the leading congress of public health workers in North America.

MUNICIPAL HEALTH DEPARTMENT PRACTICE

At the meeting of the Committee on Municipal Health Department Practice held September 16, 1925, the work of the Field Service, under Dr. Walker, was discussed and a plan was adopted. During the coming year the Field Director will engage in the following activities:

1. Render consulting service to cities, as far as possible, in the order in which responsible requests are received.

2. Make surveys and appraisals of the health activities of cities as requested so far as possible.

3. Acquaint the state health officers with the work of the Committee and its ability to assist them and coördinate the work of the Committee with that of the state officials.

4. Continue the experimental development of the Appraisal Form and recommend to the Committee such changes in it as seem advisable.

5. Stimulate coöperation with the Executive Secretary of the American Public Health Association and with the various state health officials the formation of local societies of public health workers for

   a. Studying the development of local health work.
   b. The local application of standards.
   c. Developing local support of the work of the Committee.

6. Build up in coöperation with the U. S. Public Health Service a case history of public health practice in cities.

7. Aid in the development of special studies of the major health activities.

LIST OF NEW MEMBERS

Floyd Pierpont Allen, M.D., Paducah, Ky., City Health Officer.

E. W. Bacharach, Kansas City, Mo., President E. W. Bacharach Co., designing and building water purification plants especially municipal filtration plants.

Ralph G. Beachley, M.D., Spartanburg, S. C., Director Spartanburg County Health Department.

Byron Bird, Fort Dodge, Ia., Acting Professor of Sanitary Engineering, Iowa State College.

Celestin Boudewyns, M.A., Westwood, N. J., Dairy and Milk Inspector.

Mary A. Clark, A.M., New York, N. Y., Research Statistician, Joint Committee on Methods of Preventing Delinquency.

J. F. D. Cook, M.D., Waubay, S. D., Superintendent South Dakota State Board of Health.

Phyllis M. Dacey, R.N., Kansas City, Mo., Superintendent Visiting Nurse Assn.

Frank Clarke Dugan, B.C.E., Louisville, Ky., Director Bureau of Sanitary Engineering, State Board of Health.

Marie G. Dwyer, R.N., Sidney, O., Supervisor of Public Health Nurses of Sidney, Hygiene Instructor and Director of Health.

Walter S. Frisbie, Washington, D. C., Chemist in Charge of Coöperation, Bureau of Chemistry, Federal Food and Drugs Act.

Thompson B. Graham, New York, N. Y., Metropolitan Life Insurance Company. (Assoc.)

E. T. Hanley, M.D., Seattle, Wash., Commissioner of Health.

Harriet L. Hartley, Philadelphia, Pa., Chief Division of Child Hygiene, Department of Health.

John B. Hawley, B.S., Fort Worth, Texas, Purification of Water and Sewage.

Nicolas G. Koitcheff, M.D., Sofia, Bulgaria, Chief of Vital Statistics, Public Health Service. (Assoc.)

Edith Kuhns, B.S., Helena, Mont., Technician in State Hygienic Laboratory.

Harriet Leck, R.N., Hartford, Conn., Director of Visiting Nurse Assn.

Frank C. Makepeace. M.D., Spencer, West Va., U. S. Public Health Service.

Francis N. Maxfield, Ph.D., Columbus, O. (Formerly Director of Special Education Board of Pennsylvania State Department of Public Instruction.)

Joseph W. Mountin, M.D., Jefferson City, Mo., Commissioned officer (P. A. Surgeon), U. S. Public Health Service.

Edith L. Olson, R.N., Waubay, S. D., State Supervisor, Public Health Nursing.

Florence M. Patterson, R.N., Boston, Mass., General Director, Community Health Assn.

Mary E. Stebbins, R.N., Columbia, Mo., Health and Nursing Specialist, Missouri College of Agriculture.

Robert M. Stith, M.D., Richmond Highlands, Wash., In Charge Division of Tuberculosis Control, Seattle Health Department.

Esther L. Swartz, Ph.B., New York, N. Y., Assistant to Dr. Mary S. Rose, Columbia University.

Harry B. Weston, Winnipeg, Can., Venereal Disease Technician, Board of Health, Government of Manitoba.

Leon G. Williams, B.S., Long Beach, Calif., Hydraulic Engineer, Long Beach Sewer Dept.

Ralph C. Williams, B.S., M.D., Washington, D. C., Regular commissioned medical officer, U. S. Public Health Service.

Alice Wilson Wilcox, A.B., A.M., Gainesville, Ga., Professor of Biology in Brenau College, Gainesville.

Emma A. Winslow, P.H.D., New York, N. Y., Publicity and Research Secretary, Child Health Demonstration Committee.

EMPLOYMENT BUREAU

HELP WANTED

The Employment Bureau of the Association has had requests for the following types of workers:

Director of city public health laboratories and city bacteriologist in southeastern city. Doctors of medicine with special public health training as well as experience in public health laboratory work preferred. Well-equipped laboratory and good reference library are provided. Position out of politics. Only male candidates can be considered.

Tuberculosis specialist to handle the medical work of a tuberculosis demonstration and represent the organization with the medical profession.

Laboratory technician to do Wassermann tests, water and milk analyses, and other examinations of a public health nature.

Health officer in small enterprising New England city.

Members of the Association may obtain information regarding these opportunities by writing to the Employment Bureau of the Association, 370 Seventh Avenue, New York City.

POSITION WANTED

Positions wanted announcements of 50 words or less will be carried for individuals at a charge of $2.00 per insertion. Copy should be received at the New York office by the 8th of the month preceding publication.

Medical Executive, experienced in Army, municipal, industrial and association health work wants full time position; best references. Address 360, C. L., care this JOURNAL, New York address.

M.D. and Statistician open for engagement: After more than ten years' experience in the practice of medicine, followed by more than ten years' experience as director of bureau of vital statistics, I am open to an engagement where such experience will be of value to the organization with which I am associated. Address 377, D. W., care this JOURNAL, New York address.

Wanted: Teaching position in pathology, bacteriology and public health and clinical laboratory directorship. Teaching and practical experience; director of base hospital laboratory and state public health laboratory; foreign study also. American, Protestant, Rotarian; available at once. Address 336, W. S., care this JOURNAL, New York address.

Assistant Bacteriologist: Young man, age twenty-four, desires position as assistant bacteriologist. May also consider an offer as first assistant technician. Eight years' practical experience in state health department laboratory; two certificates in bacteriology from University of Chicago. Qualifications gladly submitted. Address 383, S. J., care this JOURNAL, New York address.

Laboratory Technician: Graduate nurse technician capable of doing routine laboratory work and tissue sectioning desires position in a public health laboratory, hospital or physician's laboratory. Special courses in bacteriology, serology, hematology and biochemistry. Available December 1. Excellent references. Address 381, M. R., care this JOURNAL, New York address.

Chemist and Bacteriologist desires position. Seven years' experience in operation of a water filtration plant; chemical and bacteriological analysis of water, sewage, milk, also food products. University graduate, age 29, single. Address 380, B. N., care this JOURNAL, New York address.

Wanted: Young man desires position in municipal or county laboratory as bacteriologist. Holds B.S. from eastern college and equivalent of M.S. from large mid-western university. Willing to work. Address 374, B. C., care this JOURNAL, New York address.

Health Education: Physician, age 40, with 12 years' practical experience in public health desires position with a national, state or private association that is organizing health work or conducting health education and publicity campaigns. Location in east preferred. Correspondence invited. Address 348, M. F., care this JOURNAL, New York address.

Wanted: Woman physician well experienced in school health work will consider a position as college physician and teacher of hygiene, or director of child welfare. Recently professor of health and physical education for 3 years in eastern college. Public health training at Harvard and Johns Hopkins. Excellent references as to ability. Address 382, R. M., care this JOURNAL, New York address.

BOOKS AND REPORTS

International Conference on Health Problems in Tropical America—*Boston: United Fruit Company*, 1924. 1,010 pp.

This book is a record of the proceedings held at Kingston, Jamaica, B. W. I., July 22 to August 1, 1924, by invitation of the Medical Department of the United Fruit Company. Among its contributors are many of the foremost students of the problems of tropical diseases from all over the world. If an enthusiastic reviewer may be permitted to say so, to anyone who is interested in tropical health problems, it is as interesting reading as the *Arabian Nights*.

Chapters are devoted to: Tropical Hygiene, Seasonal Prevalence of Disease, Malaria and Blackwater Fever, Mosquito Control, Yellow Fever, The Blinding Filaria of Guatemala, Amoebiasis, Bacillary Dysentery, Mycosis of the Hands and Feet, and many, many other interesting topics.

Etiology, epidemiology, prophylaxis and therapy are fully discussed and are of great value because of representing the diversity of opinion of many experts. Many of the things discussed have wide application right here in the United States.

The chapters on Malaria and Amoebae are particularly interesting and informative. It is a splendid book and is highly to be recommended.

A. G. BOWER

Health and Success—*By J. Mace Andress and Wm. J. Evans. Boston: Ginn and Company*, 1925. 243 pp. Price, 76 cents.

This is designed as a textbook for the use of pupils in the public schools. It is an excellent text, preferably for grades V and VI. The content is well balanced for these grades. The interests of the children should be aroused by the method of approach at the beginning of the chapters. Fundamental facts in reference to the structure and functions of the different parts of the body are presented so simply and naturally that the interest of the pupil will be held. Throughout, it presents the positive, active point of view. The hygiene held forth will lead to action. At the end of each chapter is a summary which, with even mediocre instruction, should lead to beneficial results.

Certain basic information is presented which will be valuable in later grades. This should give children a general understanding of the structure and processes of the body so that reasoned incentives are offered for the organization of healthful habits. At the close of each chapter is a summary of points to remember, health habits to be carried out, and things to do, which are well chosen, and should "drive home" the content of the chapter. This result is aided by the questions in review which are stimulating to thought.

C. H. KEENE

Laboratory Diagnostic Methods. *Pathological, Bacteriological, Serological and Chemical. A Manual for Physicians, Medical Students and Laboratory Technicians. By John A. Kolmer and Fred Boerner. New York: D. Appleton and Company*, 1925. 338 pp. Price, $2.50.

The author has given us in a book of 338 pages a most useful collection of methods for the laboratory worker. It is divided into four sections: I. Pathological. II. Bacteriological. III. Serological. IV. Blood Chemistry.

While there are no comments as to the relative value of the methods described, those given represent the ones used in the Graduate School of Medicine, University of Pennsylvania. The presumption is that they are considered in general the best.

The faults of the book are more those of omission than commission, and since there does not seem to have been any marked effort to produce a small laboratory manual, one may well complain over some of the omissions. No mention is made of the large Keidel tubes, sold by some manufacturers, containing culture media

Public health books can be most conveniently secured through the Book Service of the American Public Health Association, 370 Seventh Avenue, New York, N. Y.

of various sorts for blood cultures, though the directions given make sure that we assemble an "alcohol lamp and matches," and are explicit in naming the exact point in the procedure at which the lamp must be lighted! Other examples of such useless details are numerous. Novy's method of cultivating anerobes, though probably the best known in this country, is not mentioned. The rabbit method of diagnosing and isolating the bacillus of Welch is omitted; there is no mention of the use of antitoxin in differentiating true diphtheria from other organisms which resemble it, nor is any method for immediate diagnosis such as Ponder's or Albert's stain given; the antiformin method of culture for tubercle bacillus is omitted. Only one stain for the Negri body is given, and no mention is made of the diagnosis by examination of the ganglia, which is often the only rapid one possible when the brain has been entirely destroyed, nor is the inoculation into the eye given. The ammonium oxalate solution for Gram (Hucker) was published in 1922, and should have been included.

The Widal procedure is very faulty. Only one dilution is made, which is very inexact and apparently too concentrated. The examination of milk does not conform with the Standard Methods of the A.P.H.A., and the method advised has no advantages over the standard.

The book is well printed and while remarkably free from typographical errors, some bad ones are noted, as on page 127 where we are told to use "1 c.c. of sterile per cent solution." Its appearance is much injured by some cheap advertising pages with a few photographs of medical authors which nobody cares for.

M. P. RAVENEL

Essentials of Immunology—*By Arthur F. Coca, M.D., Professor of Immunology at the Medical College of Cornell University. Editor of the Journal of Immunology. Baltimore: Williams and Wilkins Company,* 1925. Pp. 194. Price $3.50.

Everyone who is engaged in the teaching of immunology faces the problem which the author states in his preface—the selection of subject matter from the great accumulation of material to meet the needs of a course limited as to time. The book represents the author's selection for such a purpose.

It is divided into two parts—a theoretical and a practical.

Clear-cut definitions of common terms of immunology are given and there is a simple and concise review of the most widely accepted theories regarding immunity and the nature of immune bodies. The discussion of hypersensitiveness is one of the most satisfactory chapters of the theoretical part.

The practical part of the book includes good general directions and suggestions regarding apparatus and technique, and gives the procedures for representative laboratory tests.

The book is above all readable and usable and should help to fill a real need.

It is to be regretted that a theoretical consideration of the Wassermann reaction is entirely omitted by the author, but as he points out later, such a consideration is almost a personal one. In view of the great interest manifested by the student in this reaction it would seem that a brief survey of theoretical explanations might prove an addition to the book. One is surprised at not finding a discussion of fixation and deviation of complement, and here also we are inclined to think that something of value has been sacrificed to brevity.

"Essentials of Immunology" will be welcomed by students and by instructors in the subject. It is not intended as a book of reference, but as a practical guide for medical students in the study of immunology. This object has been achieved in a most satisfactory way.

ANNA DEAN DULANEY

Faith and Health—*The True Way of Attaining Health Through Faith. By Solomon Cohen. Brooklyn: Theistic Publishing Company,* 1924. 144 pp. Cloth. Price, postpaid, $2.00.

We would not review this book except for its title which is liable to lead some persons into believing that it contains a rational consideration of health. It does contain some well put statements concerning the bogy of patent medicines, and the widespread fallacy that "there is a pill for every ill"; but there are a great many misstatements concerning the practice of medicine and the evidence of fundamental misunderstanding of modern medicine. The germ theory of disease is considered demoralizing since it absolves patients from responsibility!

The author has a clear and rational conception of the various types of faith healing, as shown by the following quotation: "No one nowadays expects a fractured leg or a broken skull to be mended by prayer. Nor should any one expect to rid his system of its toxic

poisons by means of verbal incantations or hypnotic formulas. Physical ills require physical cures, and blind faith in miracles always entails needless sacrifice of human lives. We no longer sacrifice our children in the old heathen way, but to let them die in needless agony, in the belief that their suffering is merely imaginary, is the way many misguided parents nowadays offer up their children on the altar of modern superstition." In spite of this, however, the author might be considered a Jewish Christian Scientist, since he ends by saying that ". . . we shall obtain health through our faith in God. The thought that God is always with us is the cornerstone of health."

About one-half of the book is made up of quotations concerning health, some of which are excellent, and miscellaneous subjects, such as anti-semitism, Mr. Ford's attitude toward Jews, etc. We cannot recommend the book except as an example of the strange workings of the human mind. M. P. RAVENEL

Tissue Culture in Relation to Growth and Differentiation—*By T. S. P. Strangeways. Cambridge: W. Heffer & Sons,* 1924. x+50 pp., 4 pls. in collotype. Price, 5/0.

These two works, which, with the present high cost of publication, might well have been combined in one, report methods and results of experimental work in tissue culture carried on at Cambridge University, England, under a grant of the British Medical Research Council. The investigations were prosecuted along the classical lines established by the American workers, Leo Loeb, Harrison, Burrows and Carrel. The writer describes in detail the behavior of various types of tissue cells in vitro in life, and describes and figures in detail his studies of mitochondria and mitosis. Cells from the embryo fowl or mouse in cold storage for fourteen days after the death of the embryo retain their power of growth. Cells dedifferentiated in culture when returned to an environment more nearly akin to that from which they were originally taken tend to resume to some extent at least their original arrangement, shape, and functions. The X-ray greatly disturbs mitosis and interferes with its occurrence, inducing hypertrophy, fragmentation of chromosomes, tripolar and multipolar mitoses, and multinucleated cells. The abnormalities persist in the culture if no overdose is given, and no procedure has been found which restores them to normalcy. The author expresses the opinion that these facts give strong reason for believing that alterations in somatic cells and body fluids by producing an altered environment may cause slight, or even profound changes in the germ cells, resulting in individuals differing from the parent stock. His experiments, however, do not go beyond changes induced in somatic cells. The closing chapter deals with inflammation and repair.

The booklet dealing with methods gives the minutest details of apparatus, technique, and experimental procedure for tissue culture from the frog, fowl, and mammal, and for the cytological study of culture cells.

C. A. KOFOID

The Erythrocyte and the Action of Simple Haemolysins—*By Eric Ponder. Edinburgh: Oliver and Boyd.* xii+192 pp., 11 figs. in text. 1924. Price 12/6 net.

This is the second volume in an "all British" series of "Biological Monographs and Manuals" under the editorship of Dr. F. A. E. Crew and Mr. D. Ward Cutler patterned after the American series of "Biological Monographs." The subject is of interest to all who have to do with laboratory examination of the blood cells or with laboratory procedures involving hemolytic agents. It contains a critical discussion of the erythrocytes in all groups of the vertebrates and an all too brief note on the invertebrates. There is a critical discussion of the conflicting evidence as to the size and shape of human erythrocytes. The author rejects Weidenreich's view that erythrocytes are bell-shaped in favor of that of the biconcavity as the normal one, but makes no decision among the theories as to the cause of this shape. He gives a very full discussion of the size of the erythrocytes. His own researches lead to the conclusion that 8.8 microns is the average size of the living cells, with a variation not exceeding 0.1 micron under like conditions, with a diurnal change of 0.5 micron, being smaller at night than by day and increasing with the CO_2 content of the blood. The volume of the red cell is between 70 and 80 cubic microns.

The second section of the book dealing with the action of simple hemolysins is a critical survey of our present knowledge of this difficult and complicated field. Cells differ in their resistances to the hemolysin. The differences form an ideal frequency curve,

the rate of the reaction has a constant velocity, and variations in the curve are due to accelerations or inhibitions produced principally by the hemoglobin liberated by the cells. There is a latent period before hemolysis begins in which the lysin is attacking the cells. The amount of substance converted is equal in unit time from the commencement of lysis till the point of complete hemolysis. The work is critical and full of valuable hints as to the sources of error in this field. C. A. K.

Personal Hygiene Applied—*By Jesse Feiring Williams, M.D., Professor of Physical Education, Teachers College, Columbia University, New York City. Second ed. rev. Philadelphia and London: W. B. Saunders Co.,* 1925. 414 pp., illustrated. Price, $2.00.

The first edition of this book appeared in 1922. It was reprinted the same year; three reprints appeared in 1923 and one in 1924. This history shows that the good opinion expressed in our review of the first edition was widely shared by those interested in personal hygiene. The second edition has not been greatly changed and the size of the book remains practically the same. It has been brought up to date in respect to new discoveries, such as those in regard to scarlet fever, diabetes, goiter, etc., and the readers will find in it, as in the first edition, an original method of treatment of the subject, full of sound teaching and the wise application of known facts. M. P. R.

Ankylostomiasis and Bilharziasis in Egypt—*No. 6, Reports and Notes of the Public Health Laboratories. Cairo: Government Publications Office, Ministry of Finance, Dawawin P. O., Cairo, Egypt.* 196 pp. Price, piaster 30.

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The chapters on the relation of heredity to health and disease; on the relation of environment to health and disease; on eugenics; and on euthenics, we fear will not be light reading for the average man of non-scientific training. The balance of the book deals with a wide range of subject matter and is both well written and easy reading. On the whole, the book is well worth the time any interested person may care to devote to it. A. G. B.

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C. A. KOFOID

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the rate of the reaction has a constant velocity, and variations in the curve are due to accelerations or inhibitions produced principally by the hemoglobin liberated by the cells. There is a latent period before hemolysis begins in which the lysin is attacking the cells. The amount of substance converted is equal in unit time from the commencement of lysis till the point of complete hemolysis. The work is critical and full of valuable hints as to the sources of error in this field. C. A. K.

Personal Hygiene Applied—*By Jesse Feiring Williams, M.D., Professor of Physical Education, Teachers College, Columbia University, New York City. Second ed. rev. Philadelphia and London: W. B. Saunders Co.,* 1925. 414 pp., illustrated. Price, $2.00.

The first edition of this book appeared in 1922. It was reprinted the same year; three reprints appeared in 1923 and one in 1924. This history shows that the good opinion expressed in our review of the first edition was widely shared by those interested in personal hygiene. The second edition has not been greatly changed and the size of the book remains practically the same. It has been brought up to date in respect to new discoveries, such as those in regard to scarlet fever, diabetes, goiter, etc., and the readers will find in it, as in the first edition, an original method of treatment of the subject, full of sound teaching and the wise application of known facts. M. P. R.

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about the production, preservation and handling of foods which are in common use, and on which everyone depends.

The book is written for English students and here and there terms are used which have no meaning for the average American reader. "Certified milk," a term invented and copyrighted in this country, has another meaning in England, and the grades of milk given are not applicable in this country.

As far as the book goes it can be recommended as readable and for the most part accurate, but it is in no sense a complete exposition of the subject of which it treats. Some of the references are deplorably old, unless they are intended only as history, which does not seem to be the case. Much American work, recent and accurate, is ignored, while in other instances, methods which had their origin and development in this country are given without credit. Some of this may be due to the small size of the book. The printing is good and more than usually free from typographical errors, though some are seen in proper names and in dates. The illustrations are very good. On the whole, the book can be recommended. M. P. RAVENEL

An Introduction to Practical Bacteriology as Applied to Medicine and Public Health—*A Guide to Bacteriological Laboratory Work for Students and Practitioners of Medicine—By T. J. Mackie, M.D. (Glas.), D.P.H. (Oxford), and J. E. McCartney, M.D., D.Sc. (Edin.). New York: William Wood & Company.* 1925. Price, $3.50.

Laboratory guides, such as the one before us, have a place in teaching, but have their disadvantages since students who are put to it financially, or who are indolent, often attempt to pass their examinations without further reading. The reviewer is a strong believer in the historical method of teaching, and history must of necessity be omitted from such concise presentations as are given in books of this type.

We wish that more attention had been paid to American work. There is no reference to the Standard Methods for the examination of milk, water, air, and oysters, put out by the American Public Health Association. The precipitation test of Kahn is not mentioned. Williams' method of staining Negri bodies is not given; the Schick test and the toxin-antitoxin immunization are not given. The diagnostic procedure recommended for the isolation of bacillus botulinus will result in failure in the majority of instances. Throughout the book "complement deviation" is used, apparently to include both fixation and deviation. No mention is made of scarlet fever or the Dick test. The authors adhere to the old classification of bacteria and do not even mention that proposed by the Society of American Bacteriologists. These omissions and errors, as we deem them, detract from the value of the book, especially for American students. In view of the date, 1925, the book is not abreast of our knowledge in several matters.

On the whole, the descriptions are concise and accurate and the book can be considered one of the best in its class. It is well printed but contains very few illustrations. M. P. R.

Precis de Parasitologie Humaine. *Parasites animaux et vegetaux (les bacteries exceptees). Par P. Verdun et A.-H. Mandoul.* Ed. 3, vi+937 pp., 4 colored pls., 434 figs. in text. (*Paris: Octave Doin*), 1924. Price, in paper, 40 fr.; bound, 46 fr. 50.

The first edition of this useful compendium of human parasitology appeared in 1906, the second in 1913, while the third has received its impetus from the war. The rat, the cootie, and itch insect need no introduction to the poilu. The typhus-carrying louse broke down the military resistance of the Serbians; the expeditionary forces at Salonica were held at bay by the malaria-spreading mosquito. Malaria and dysentery slew more victims than Bulgarian mitrailleuses. Colonial troops from French dependencies have enriched the parasitic fauna of France by their own abundant and varied exotic species. Malaria, once almost banished from France, has staged a come-back and necessitated the organization of anti-mosquito campaigns. Amoebic dysentery, once regarded as a tropical curiosity, has become banal in France since the war. Even the oriental boil, notorious at Aleppo and Bagdad, has appeared in French districts where colonial troops were in cantonments. Modern travel with the ever-increasing contacts with the tropics will continue to facilitate the invasion of parasites from the tropics where conditions of life favor their occurrence and distribution.

Hence, there is increasing importance to parasitology for medicine and sanitation, especially for public health and constructive efforts at prevention of infection and disease. It is no longer a necessity only for the marine hos-

pital service and the specialist in tropical diseases. One of the lasting effects of the World War will be the accelerated and prolonged fight of all war-torn countries and of veterans from the trenches with these animal and fungus enemies which cause disease. It is too largely based on French sources; needs more careful editing in matters of foreign names, and could be much improved with more modern illustrations. C. A. KOFOID

The Internal Secretions of the Sex Glands. The Problem of the "Puberty Gland"—*By Alexander Lipschütz, M.D. With a preface by F. H. A. Marshall. Baltimore: Williams & Wilkins Co.*, 1924, xviii+513 pp., 142 figs. in text. Price $6.00.

This is an outgrowth of an earlier work, "Die Pubertätsdrüse" (1919), by this author. It incorporates much of the extensive and rapidly growing literature in this important field of endocrinology and thus affords a most timely and useful summary for those who seek to follow the very significant experimental developments in recent years in this field of profound biological, medical, and social interest. This Pandora's box hides some of the secrets of senility, sexual aberrations, some aspects of growth, and of individual efficiency and failure.

The author seeks always to orient his readers with regard to the biological significances of the experimental data which he himself has elaborated, as well as of that which he critically reviews. With true scientific caution he restricts his comment on the much exploited "rejuvenation" by transplantation to a citation of the few well established facts and of the need of critical data as to the real nature of the physiological effects of such transplants and of ligation. Most biologists will sense a lack of incorporation of the fundamentals of cytology and genetics, but possibly this is a salutary counter-irritant.

The work is an excellent example of high grade book making, with fine illustrations, well selected and well executed, and with adequate indices. The text suffers in places from lack of clarity due possibly to the author's unfamiliarity with English and to the lack of critical reading by someone less immediately in contact with the data than the author. A wider perspective and a clearer statement of the significance and relations of the complicated data herein discussed might have been attained by such a reading. C. A. KOFOID

Health and Safety in the New Curriculum—*A Teacher's Training Book—By E. George Payne, Ph.D., and Louis C. Schroeder, M.D. New York: The American Viewpoint Society, Inc.*, 1925. 318 pp. Price $2.00.

The most striking feature of this book, designed for the training of teachers, is the difference in our ideas of what children should be taught in the present day as compared with what our fathers believed, when the three R's comprised the curriculum.

Especial attention is given to the prevention of accidents and we can give no better idea of the general trend of the book than to point out such subjects as the crossing of streets and railroad tracks; the handling of electric wires; stealing of rides; the use of matches and kerosene; and so on, even to the stairs of the basement and rubbish which it may contain. In all of the major subjects, health and accident prevention are emphasized: in drawing, arithmetic, history, geography, general science, etc.

The book puts an entirely new aspect on the education of children and one which we are not entirely prepared to accept in its entirety.

The reviewer has for many years believed, and has often said, that the teachers of the country are our best agents for inculcating the doctrines of personal and public hygiene. They come into intimate contact with children, many of whom come from homes in which knowledge of such things is conspicuous by its absence, and in which there is not even an intelligent attempt to learn, when they are in a plastic state and when good ideas will make a permanent impression. It is a pleasure to testify that the teachers have realized their responsibility and opportunity more than any other class of our citizens, and are doing much to spread health education.

The book before us contains a large amount of information which every teacher should have. The teacher's knowledge must be reflected in what is passed on to the students. It is well written, in orderly sequence, and cannot fail to improve any teacher who studies it carefully. The only criticism that we can make of it is a failure to emphasize efficiency and good citizenship as the ultimate end of the knowledge in which it is so rich, though these things are mentioned in the introduction, written by Dean John W. Withers, of the School of Education, New York University. The printing and make-up are excellent. M. P. R.

Mental Disorder and the Criminal Law; *A Study in Medico-Sociological Jurisprudence. By S. Sheldon Glueck, LL.M., Ph.D., Instructor in Criminology and Penology, Department of Social Ethics, Harvard University. Boston: Little, Brown, and Company,* 1925. 677 pp. and Index. Price, $7.00.

Mental hygiene has been characterized as in the twilight zone of public health. Certainly it is a subject with which sanitarians will be and must be more and more concerned. In its relation to crime, mental hygiene is of vast importance to the whole order of society. Dr. Glueck's book is certainly one of the most valuable and useful of modern works on this important topic. It endeavors, and successfully, we believe, to interpret the law of insanity (so-called) to psychiatrists and social workers, and the psychology and symptomatology of mental disorder to lawyers and judges. Such a task is necessarily somewhat ponderous and calls for a didactic treatise, but the legal profession and mental hygienists are reasonably well informed and intelligent persons, keenly desirous of getting together on a subject concerning which they have long been accused of being widely divergent. While the present law of mental disorder and crime is and has been for years in a chaotic condition, differing with the whim of jurists in each of the states, and finding expression in varying legislative enactments, some attempt has been made by leading members of the bar, in cooperation with eminent practitioners of psychiatry and progressive sociologists, to bring order out of the existing confusion. This book is particularly constructive in that the author suggests practical remedies for the present lack of understanding and coördination between the criminal law and the problems of mental abnormality.

The book is too extensive to be digested to any degree in a review. It is a work to be studied, rather than merely read. If at times it seems a trifle redundant in its discussions, such a method of presentation is undoubtedly good psychology in a textbook.

Dr. Glueck begins by citing some striking cases illustrative of the relationship between crime and mentality. He then outlines criminal procedure, takes up mental disorder of the accused before trial, and the ethical and psychological concepts in the criminal law. In order that the reader may better comprehend the evolution of the law of insanity, he outlines in some detail its historical development from early English times to the "tests" in the American court decisions. He then considers mental disease as related to the tests of irresponsibility and outlines in an illuminating way the various types and manifestations of mental disorders and discusses the legal significance of each. He recounts the dispositions of accused persons not tried and of defendants acquitted, because of insanity or irresponsibility, and in his final chapter gives a brilliant summary of the entire subject matter of the book, with conclusions and recommendations.

There is also a valuable appendix containing state legislation governing insanity and criminal irresponsibility, as well as bibliography, and tables of cases, and statutes. The references are complete, with dates given for all court decisions and other citations, a useful system.

The book is well printed, with excellent typographical composition, and reflects great credit on its publishers, as well as on the author for his efficient arrangement.

Dr. William Healy characterized this volume as "a splendid piece of work which might well become the standard reference book on this subject."

JAMES A. TOBEY

Practical Methods in Microscopy—*By Charles H. Clark. Fifth edition. Revised and enlarged. Boston: D. C. Heath & Co.,* xxviii + 337 pp., 19 pls., 82 figs. in text. Price $3.00.

The fifth edition of this well known manual of the microscope deals mainly with the instrument as such and with photomicrography. The mechanical and optical parts, their structures, uses and manipulation are set forth accurately, concisely, and adequately. Many practical hints for the use of the microscope will be found here, as well as explanations of basic principles on which the instrument is constructed, concerning which not a few otherwise well trained scientists and investigators are inadequately informed. The scope of the book is a broad one. Aspects of microscopy often omitted in more highly specialized treatises in microtechnique and bacteriology are here available, as, for example, the chapter on micrometry. For this reason it is a useful book in the public health laboratory. It is to be regretted that an account of the monobjective binocular is not included and that the chapters on microtechnique do not include more of the refined methods developed in recent years.

C. A. K.

Americanitis—Blood Pressure and Nerves—*By William S. Sadler, M.D., F.A.C.S. New York: The Macmillan Company*, 1925. 176 pp. Price $2.00.

This book is founded upon an address first prepared in 1905 under the name "Americanitis, or the High Pressure of Life." Since that time the author says that he has given this lecture more than 500 times in various parts of the country, revising it from time to time and keeping it up to date. There seems to be little doubt that we Americans break down early and that we live too hard and too fast. The accumulation of wealth seems to lead only to a desire for more wealth and more power. Success in professional life leads to harder work instead of to a degree of rest which has been justly earned.

The author rightly says that we know much more about the evil effects of blood pressure than we do about its causes, but even in the imperfect state of our knowledge, we are certain that the average person does many things which are contrary to common sense and inimical to longevity.

While the book is written in popular style and contains a number of anecdotes collected from personal practice, which appeal to the human interest side rather than to the scientific, it contains a great deal of good advice written in a pleasing and readable style. The appendix gives a diet list which is indicated in all forms of kidney disorder and high blood pressure.

M. P. RAVENEL

Handbook of Bacteriology for Students and Practitioners of Medicine—*By Joseph W. Bigger, M.D. (Dublin), F.R.C.P.I., D.P.H., Professor of Bacteriology, University of Dublin. New York: William Wood & Company*, 1925. 429 pp. Price $5.00.

The author has written this book with the expressed purpose of getting away from the longer text books, since he finds that students are unable to cover the ground given in the ordinary texts, and often depend upon grinder's notes and quiz compends in order to pass their examinations. Every teacher recognizes the truth of this danger, and we welcome a book of moderate size which is yet complete enough to give the student the essential facts. The larger part of the book is devoted to what is essentially bacteriology, while the latter part describes the protozoa, higher fungi and filterable viruses. There are good chapters on immunity and the phenomena of immunity, such as anaphylaxis, hypersensitiveness, etc. The more familiar terms are used throughout as headings in heavy type, the alternative names, which in the majority of cases are those recommended by the Committee of the Society of American Bacteriologists, following. Lastly the names of the discoverer (in some cases not correctly), with the date of the discovery of each germ, is given. Throughout, the author uses the English type of spelling, which he considers more correct considering the derivations. He does not adhere to certain American uses, using the word "tubercular" to describe lesions due to the tubercle bacillus, while we use the form "tuberculous," reserving "tubercular" as an adjective to describe the appearance of lesions regardless of their etiology.

The book is well illustrated, with some unusually good plates in colors. Altogether, the book can be recommended as being well above the average. The index is unusual in type. Where a subject is mentioned incidentally in the text, it is indexed in light faced type, while the pages devoted to the subject are given in black faced type, so that one can immediately refer to the one or the other. M. P. RAVENEL

The Essentials of Healthful Living—*By William S. Sadler, M.D., F.A.C.S. New York: The Macmillan Company*, 1925. 481 pp. Price, $3.50.

We are suffering from a veritable deluge of books on health, very few of which add anything new to our knowledge or present the subject in a more acceptable way than other books which are already on hand.

The book before us is written for the layman and covers a wide range of subjects. In the main, the facts are correctly stated in an acceptable manner. There are, however, certain statements which lead to confusion. For example, the Wassermann test is given as one thing, and complement fixation as an entirely different thing, which is said to be "chiefly used at the present time in detecting a latent or uncured gonorrhea." It is needless to say that the Wassermann is a complement fixation test and that this principle is applied to a number of other diseases besides syphilis and gonorrhea. While we do not expect the public to be initiated into the intricacies of these tests and their underlying principles, there does not seem to be any good reason for misleading them by such statements.

The book is well printed and pleasant to read, but contains no illustrations. M. P. R.

Injury, Recovery, and Death, in Relation to Conductivity and Permeability—*By W. J. V. Osterhout. Philadelphia: J. B. Lippincott Co.* 259 pp., 96 figs. in text. Price, $2.50.

The author is the successor of the late Professor Jacques Loeb at the Rockefeller Institute and one of the co-editors of the Monographs on Experimental Biology, in which series this work is included. The purpose of the work is to make an investigation by quantitative methods of those elusive biological phenomena which are enumerated in the title of the work. The author has determined that the electrical resistance of the marine plant Laminaria is an excellent indicator of the degree of its vitality. Measurements of this resistance thus afford means of testing the results of injury by various chemical agents. Thus in pure NaCl the electrical resistance falls steadily till the death-point is reached, after which there is no further change. The time curve of this process is that of monomolecular reaction. It may be expressed in an equation which makes it possible to predict the curve of death under various conditions. Death is thus a process which may be followed as a chemical reaction *in vitro*, and thus subjected to mathematical analysis. These analyses lead to the quantitative substantiation of the view of Claude Bernard that the death process is always going on even in the normal, growing cell. It produces no disturbance unless accelerated by an injurious agent which brings the life process to a standstill.

Changes in electrical conductivity of the cell run parallel to changes in the permeability of the protoplasm. The conductivity is thus a measure of the permeability by ions which conforms to other tests such as plasmolysis, tissue tension, and diffusion of salts. Plants in a normal environment have a uniform resistance. When injured, the loss of resistance is a measure of the amount of the injury. Recovery is complete only when the injury is slight; when the injury amounts to 90 per cent there is no recovery. Quantitative studies make it possible not only to measure the injury but also to predict the curve of recovery. Recovery is usually regarded as the reversal of the reaction producing injury. The concept developed in this book is fundamentally different. It assumes that the reactions are irreversible and that injury and recovery differ only as the relative speed at which certain processes in each take place. This concept is a phase of the broader view that life depends on a series of reactions which normally proceed at rates bearing definite relations to each other. Stimulation, development, injury, and death are due to disturbances in these relations. The investigation of fundamental concepts such as injury, recovery and death by quantitative methods results in equations having predictive values. The importance of such equations is as great in biology as in physics and chemistry. The analysis and control of life processes depends upon the application of the quantitative method according to the laws of chemical dynamics. There is much in this mathematical investigation of injury and recovery for those who deal with infections and disease to contemplate as basic for preventive medicine.

C. A. KOFOID

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C. A. K.

Medical Certification for Marriage—*By Fred S. Hall. New York: Russell Sage Foundation*, 1925. 92 pp. Price 50 cents.

Legislation similar to the so-called Wisconsin "Eugenic Marriage Law" is commanding increasing attention throughout the United States. Under the terms of this law, no man applying can receive a marriage license unless provided with a physician's certificate which attests that he is free from acquired venereal

diseases. Laws of the same type have also been enacted in Alabama, Louisiana, North Carolina, North Dakota, Oregon, and Wyoming. In 1923, legislation of this kind was defeated in 14 states, and approximately the same number considered similar bills in 1925, one state, Idaho, having this year enacted it into law. The results of the study of the Wisconsin law show a mass of conflicting opinions, and while the evidence obtained may not be conclusive, either in favor of the Wisconsin law or against it, it emphasizes the importance of the subject as one of extreme social concern.

The Wisconsin law, when it was first enacted, contained some serious defects. For example, it required laboratory tests in every case at a time when free laboratory service was not available. Added to that was the fact that the law had behind it no public agency charged with its enforcement and few private agencies actively interested in its success. Another serious objection to the successful operation of the law was the failure at the beginning to secure or to try to secure the support of the medical profession. As a matter of fact, the first law aroused considerable antagonism among the physicians and this no doubt constituted a serious drawback for its successful operation for several years.

Mr. Hall believes, however, that on the whole, the Wisconsin law has been of value and is capable of being made much more effective by certain amendments which he has suggested in the booklet and by the adoption of higher standards of administration which are suggested in the text.

The booklet is recommended to all persons, regardless of their opinion, as a most valuable study and as an excellent presentation of facts, which are given without prejudice.

GEORGE E. WORTHINGTON

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This volume is an attempt to correlate material for the benefit of those who wish to know the probable nomenclatural status of the various names which have been used in bacterial terminology, being the first of a series of monographs in the general field of systematic bacteriology.

The first chapter, "Classification of the Genera and Higher Groups of Bacteria," gives a brief history of the various classifications of bacteria that have been proposed up to the present time. Chapter two, "Codes of Nomenclature and Their Application in Bacteriology," has to do with the nomenclatural codes and their relationships to bacterial terminology problems. The third chapter, "Nomenclatural Status of Names Which Have Been Applied to Groups of Bacteria of Higher Rank than Species," is a lengthy one and is the most valuable in the book, being an alphabetical list of all the names used by various authors to designate bacterial subgenera, genera or higher groups in so far as revealed by the literature.

An extensive bibliography adds to the volume.

E. H. B.

Health Education—*A Program for Public Schools and Teacher Training Institutions. Report of the Joint Committee of the National Education Association and the American Medical Association*, 1924. 161 pp. Price, 60 cents.

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1. To instruct children and youth.
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The reason for such education is taken up in first chapter under Major Causes of Death, Childhood's Loss Through Communicable Disease, Physical Defects, Mental Health, and Allied Topics.

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The Program has evidently been the result of much thoughtful preparation and ought to be extremely helpful to teachers seeking reference matter, especially for high school use. The average teacher may consider it rather lacking in detail.

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M. E. C.

HEALTH DEPARTMENT REPORTS

IRA V. HISCOCK

East Orange, N. J.—One of the most interesting and unique health department reports for 1924 is that of East Orange. The score of community health activities as based on the national rating schedule is given graphically on the first page of the report. This is followed by a list of members of the board and of the department. As this is a report of 91 pages it is helpful that a table of contents is also added. An introductory statement reviews recent efforts in the standardization of health practice through surveys and the development of a rating schedule. The body of the report is offered as an example of how this rating schedule fits when applied to one city. The death rate declined, falling from 10 per 1,000 population to 9, which represents a saving of 60 lives for the year. The infant mortality rate, based on 5-year averages, dropped from 61 for the year 1915–1919 to 46 for the years 1920–1924. Progress has been made in diphtheria immunization work, and children previously Schick tested were retested during the year, while Schick tests were made of 984 new public school pupils and 283 parochial school children. The retest showed that practically half the public school or 3,587 public school children were immunized against diphtheria. All prenatal work is conducted under the auspices of the Maternity Center with the nurses of the Visiting Nurses Association making visits and attending at prenatal clinics. Baby welfare work has been conducted by the health department on the district basis. The report concludes with three pages of recommendations for future activities, together with a classified financial statement.

Newark, N. J.—Newark's 40th annual report of the department of health for the year 1924 is interesting, well illustrated, printed in good type, and bound in soft grey paper covers. On the first page is given a picture of Brown Bird, the faithful horse which "saves babies' lives—gives over 600 doses of antitoxin annually." In succeeding pages are given a table of contents for the 297 pages, a list of employes of the department, and reports from various divisions, followed by a classified financial statement.

In the health officer's report are summarized some of the most notable events in health work in 40 years. Upon an estimated population for 1924 of 446,000, is calculated a crude death rate for the year of 11.2 per 1,000, which is the same as that recorded in 1921, the lowest recorded in the history of the city. The reduction in mortality for the year was principally seen in the low prevalence of epidemic respiratory diseases. The number of deaths from accidents was 42 fewer for 1924 than for the previous years. The ages at death in accidents were commonest at 25–64 years, 52.4 per cent of the total as compared with accidental deaths under 5 years, which comprised 10 per cent. The increased deaths were most notable for whooping cough, apoplexy, puerperal disease, and Bright's disease.

An effective chart shows the striking reduction of the typhoid fever menace since a water supply from the well-protected Pequanock watershed was installed in 1892, the rate in 1924 being 2.7 per 100,000 as compared with a rate of over 75 between 1889 and 1892. Newark's infant mortality decline since 1900 is also graphically portrayed, the rate for 1924 being 65.2 deaths of infants per 1,000 living births. One of the features of the report is a special article calling attention to the importance from a public health standpoint of heart disease, and urging education of the public in the danger of the child of rheumatism, growing pains, chorea, and repeated sore throats. The total disbursements of the health department for the year amounted to 78 cents per capita.

Montclair, N. J.—The 30th report of the town of Montclair, for the year 1924, has been carefully prepared and well printed, although the type might well have been larger for easy reading. The town is credited with a population of 31,900, an infant mortality rate of 53.2 (10.8 lower than in 1923), and a crude death rate of 8.5. There were 119 cases of tuberculosis reported with 25 deaths. Graphs are used in showing laboratory results as well as trends of infant mortality and growth of population.

New Britain, Conn.—The 19th annual report of the New Britain board of health contains 15 pages of information concerning activities and progress in health work in this city of 60,000 population for the year 1924. The or-

ganization of the board and the department, and a classified financial statement, together with brief accounts of divisions and statistical tables are included. The total expenditures amounted to 96 cents per capita. A general death rate of 10.6, and an infant mortality rate of 74 are recorded.

Milwaukee, Wis.—Milwaukee is one of the cities in which the annual report of the health department is combined with that of other branches of municipal government. The report of the common council of the activities of the city departments, boards and commissions for 1924 contained 107 pages bound in a yellow covered booklet, 8x12¾ inches in size. The public health section occupies approximately 8 pages. The type is too small for easy reading, and there are few illustrations. For the purpose of giving in a somewhat popular manner a brief account of departmental activities, however, this form of report doubtless achieves its purpose.

The health record for 1924 is said to have been the best in the history of the city, for while once before, in 1921, the death rate reached the same low point of 9.8 deaths per 1,000 population, the birth rate was lower for that year. The decrease in infant mortality has been marked, as shown by a rate of 68 deaths of infants per 1,000 living births in 1924 as compared with a rate of 145 in 1910. The birth rate in 1924 was 24.1 per 1,000 population.

The work of the department is divided among 10 bureaus and divisions. Brief reports of the various divisions are followed by carefully prepared statements of recommendations of a progressive character. Under child welfare, for example, the following is noted: "In order that this division may maintain the standard that now prevails and may prosper still further, the following recommendations are made: The employment of one full-time physician in place of the two part-time physicians employed at the present time. A considerable increase in the nursing service. The appointment of a supervising nurse especially trained in health center and child welfare nursing. An increase in the number of clinics. The establishment at the north and south side stations of prenatal clinics. The establishment of preschool clinics for children who are about to enter school."

BOOKS RECEIVED DURING SEPTEMBER, 1925

INTRODUCTION TO AMERICAN GOVERNMENT. By Ogg and Ray. New York: Century, 1925. Pp. 625. Price, $3.25.

THE LITTLE CHILD IN OUR GREAT CITIES. By W. Bertram Ireland, Staff Associate, Division of Research, American Child Health Association. New York: American Child Health Association, 1925. Pp. 201. Price, $1.50.

HEALTH AND EFFICIENCY. Revised Edition. By O'Shea and Kellogg. New York: Macmillan, 1925. Pp. 347. Price, 96 cents.

OUR GOVERNMENTAL MACHINE. By Schuyler C. Wallace. New York: Alfred A. Knopf, 1924. Pp. 223. Price, $2.00.

REGULATION OF PHYSICIANS BY LAW. A Dissertation on Regulation of Law of the Occupation of Healing Diseases of Human Beings. By Harry Eugene Kelly. Chicago: American Medical Association, 1924. Pp. 48.

MOTHER'S MANUAL. The Coming and Care of the Baby. New York: Brentano, 1925. Pp. 247. Price, $2.00

THE ELEMENTS OF PEP. A Talk on Health and Efficiency. By William S. Sadler, M.D. Chicago: American Health Book Concern, 1925. Price, $1.50.

THE MINISTRY OF HEALTH. By Sir Arthur Newsholme. New York: Putnam, 1925. Pp. 271. Price, $2.00.

AN INTRODUCTION TO OBJECTIVE PSYCHOPATHOLOGY. By G. V. Hamilton, M.D. St. Louis: Mosby, 1925. Pp. 354. Price, $5.00.

THE VISITING TEACHER IN ROCHESTER. By Mabel Brown Ellis. New York: Joint Committee on Methods of Preventing Delinquency, 1925. Pp. 205. Price, 75 cents.

MANUAL OF AMERICAN WATER WORKS PRACTICE. Published under the auspices of the American Water Works Association. Baltimore: Williams & Wilkins, 1925. Pp. 790. Price, $5.00.

OCCUPATION AS A SUBSTITUTE FOR RESTRAINT IN THE TREATMENT OF THE MENTALLY ILL. By L. Vernon Briggs, M.D. Boston: L. Vernon Briggs, M.D., 1923, Pp. 205. Price, $5.00.

CANNED GOODS IN RELATION TO HEALTH. By Wm. G. Savage, M.D. New York: Macmillan, 1924. Pp. 144. Price, $3.40.

PRECIS D'HYGIENE. Third Ed. By Jules Courmont, Ch. Lesieur and A. Rochaix. Paris: Masson et Cie., 1925. Pp. 901. Price, 45 francs.

ESSENTIALS OF PSYCHIATRY. By George W. Henry, M.D. Baltimore: Williams & Wilkins, 1925. Pp. 199. Price, $2.75.

PHYSIOLOGICAL CHEMISTRY. Third Ed. By C. J. V. Pettibone, Ph.D. St. Louis: Mosby, 1925. Pp. 404. Price, $3.25.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

BELK, WILLIAM P., and DUFF, MARGARET. A Possible Source of Error in the Use of Russell's Double Sugar Medium. *J. Lab. & Clin. Med.*, 10:1005 (Sept.), 1925.

This medium is not a suitable one from which to study morphology since *B. Typhosus* and some other members of the Gram-negative intestinal group of bacilli develop an atypical morphology.

BOYCE, EARNEST. Some Sewage Disposal Problems Discussed. *Am. City*, 33:266 (Sept.), 1925.

Brief consideration of sewage treatment principles, disposal of industrial wastes and protection of plants against storm water. Form used in monthly operation report of sewage disposal plant given.

BRIEDIGAN, F. T., and CHANG, T. M. A Micromethod for the Enumeration of Microcolonies. *J. Lab. & Clin. Med.*, 10:931 (Aug.), 1925.

The use of a counter is impracticable for counting small colonies or organisms which cannot be detected by the unaided eye. Description of a method which furnishes a definite recognition of the microcolonies, making a more reliable and accurate count.

BROOKS, VERA H. The Place of the School Nurse in the School Health Education Program. *Pub. Health Nurse*, 17:458 (Sept.), 1925.

The nurse should stimulate in the teachers an interest in health and be a health educator in the community at large as well as the school and home.

BROWN, E. W. Report of Lead Poisoning among Oxyacetylene Welders in the Scrapping of Naval Vessels. *U. S. Naval M. Bull.*, 23:187 (Sept.–Oct.), 1925.

A total of 83 first admissions and 29 recurrences of plumbism occurred by the inhalation of lead volatilized in fumes arising from the burning of paint from scrap metal. Discussion of symptomatology and pathology of the cases and the preventive measures taken.

BUCAN, GEORGE F. The Public Health Service as a Career. *Med. Off.*, 34:103 (Sept. 5), 1925.

"The doctor who elects to adopt the public health medical service as a career has before him the practice of medicine of the future. His life work will not be to treat the sick, but to keep the people well."

CHAPIN, CHARLES V. Measles in Providence, R. I., 1858–1923. *Am. J. Hyg.*, 5:635 (Sept.), 1925.

Discussion of the periodicity, age incidence, percentage of population attacked, seasonal distribution, case fatality, contagiousness, interval between primary and subsequent cases, recurrence of measles in the same person, and relation of the disease to school attendance. Illustrated by tables and charts.

CHAPMAN, J. E. Occupation and Tuberculosis. *J. Roy. San. Inst.*, 46:119 (Sept.), 1925.

A summary of the experiences gained during the past 20 years with regard to the employment of tuberculous patients and some practical conclusions as to the problem in the future.

CROSS, HAROLD DEWITT. Some Features of Dental Public Health Administration. *Pub. Health Nurse*, 17:443 (Sept.), 1925.

The plan of the Forsyth Dental Infirmary, Boston, and the results obtained.

Degrees and Diplomas in Public Health. *Med. Off.*, 34:104 (Sept. 5), 1925.

The rules and regulations for degrees in sanitary science, public health or state medicine. Information regarding public health degrees and courses in the leading universities of the British Isles.

DONALD, H. G. The Occurrence of Threadworms in Children. *Med. Off.*, 34:121 (Sept. 12), 1925.

In the medical examination of 1,383 school children, 26 per cent were found to have threadworms, a condition due to neglect of personal hygiene.

DOWLING, OSCAR. Three Great National Health Problems. *Jour. A. M. A.*, 85:484 (Aug. 15), 1925.

Consideration of the problems that drug addiction, rabies, and venereal diseases present to the public health officers today.

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The mode of dissemination, symptomatology, laboratory diagnosis and specific therapy. The diagrammatic representation of the principal symptoms and signs, and of the course of the disease is instructive.

DRAPER, W. F. The Occurrence of Smallpox in the United States and Measures Taken by the Federal Government for its Control. *Boston M. & S. J.*, 193:466 (Sept. 3), 1925.

A brief review of the incidence in the United States during the last quarter of a century with special consideration of recent outbreaks with a high mortality. Discussion of the prevention of interstate spread of smallpox and the federal control of vaccine virus.

FERRELL, JOHN A. Health in Relation to Citizenship in Urban and in Rural Communities. *Jour. A. M. A.*, 85:497 (Aug. 15), 1925.

Discussion of the scope, necessary personnel and cost of community health work with special consideration of the present handicap of rural communities and dangers for the urban communities in health maintenance.

FROST, HAROLD M. Hypertension and Longevity. *Boston M. & S. J.*, 193:241 (Aug. 6), 1925.

A critical study of 2,568 cases of hypertension reported 1919–1924. The author concludes that a large proportion of hypertensive disease is caused by irrational living due to the rapid pace of our life, and that by recognizing the early signs and adopting simple methods of correction much can be done to prevent or retard its development.

GAUTHIER, AIMÉ. Anti-typhoid Vaccination. *World's Health*, 6:332 (Aug.), 1925; *Ibid.*, 6:374 (Sept.), 1925.

Discussion of the nature, causes, frequency and gravity of typhoid fever, and the general prophylaxis by means of sanitation, special prophylaxis by means of vaccination and the methods for extending the general practice of anti-typhoid vaccination. Valuable table given showing typhoid cases and deaths in many countries.

GIBSON, COLE B. The Sanatorium Treatment of Juvenile Tuberculosis. *Boston M. & S. J.*, 193:457 (Sept. 3), 1925.

Excellent presentation of what today comprises the sanatorium treatment; possibilities of accurate classi-

fication, case of individual treatment in conjunction with group management, coördination of treatment with continuance of education, therapeutic discipline, application of special treatment methods, and the dietary.

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Discussion and presentation of chronological charts, spot maps, case records, and special graphs to be used.

HAYHURST, EMERY R. Industrial Health Under Nonmedical Supervision. *Jour. A. M. A.*, 85:560 (Aug. 22), 1925.

Industrial health "requires sanitarians to take charge, both official and nonofficial, medical and nonmedical, with local health departments supervising, and guided considerably by the experience of those industrial physicians and surgeons whose duties actually extend to hygiene and sanitation of working conditions."

HUTT, C. W. Public Health in Hungary. *Pub. Health* (London), 38:361 (Sept.), 1925.

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KEIM, HARTHER L., and KAHN, R. L. Clinical Studies on the Kahn Reaction for Syphilis. II. Specificity of Test. *J. Lab. & Clin. Med.*, 10:1013 (Sept.), 1925.

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Experiments conducted showed that the Klebs-Loeffler bacilli isolated from fowls corresponded identically, in some instances, to the diphtheria bacilli isolated from humans, suggesting that fowls can disseminate diphtheria among human beings.

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Able presentation of the mode of transmission of bacillary and amoebic dysentery with spiral consideration of human carriers.

MAXCY, KENNETH. Mild Typhus (Brill's Disease) in the Lower Rio Grande Valley. *Texas State J. M.*, 21:282 (Sept.), 1925.

In the epidemiological observations upon some 70 cases, the body louse (P. humanus var. corporis) was not found in a single instance although the head louse (P. humanus var. capitis) was present, suggesting that the latter may be the vector responsible for the transmission of the disease.

MELLEN, ARTHUR F. Use of Iodides in Water Supplies, to Prevent Simple Goiter. *Eng. News-Rec.*, 95:352 (Aug. 27), 1925.

Case presented and professional criticisms reviewed. The plan for Minneapolis, Minn., and the local objections encountered.

NEALE, EDWARD P. A New Zealand Study in Infant Mortality. *J. Am. Stat. Assn.*, 20:354 (Sept.), 1925.

Statistical analysis of the birth and infant mortality rates from 1872 to 1923. "The low rate of infant mortality can in no way be attributed to a coexistence of complete birth-registrations in the face of defective death-registrations."

PARK, WILLIAM H. Scarlet Fever—Etiology, Prevention and Serum Treatment. *Monthly Bull.* (New York City Dept. of Health), 15:66 (July), 1925.

Particular reference to the work of the Dicks, Moser, Savchenko, Gabritschewsky and Dochez. Results of original investigations by the author and co-workers given.

PETERS, WM. H. The Development and Use of a New Appraisal Form for Experimental Use in Measuring City Health Work. *Cincinnati J. M.*, July, 1925.

Brief discussion of the value of the tentative appraisal form for city health work.

PURDY, J. S. The Organization of Propaganda in the Interests of Public Health. *Pub. Health* (London), 38:370 (Sept.), 1925.

Publicity experiences in Australia during health weeks.

RICHARDSON, FRANK HOWARD. Universalizing Breast Feeding in a Community. *Jour. A. M. A.*, 85:668 (Aug. 29), 1925.

Discussion of the Sedgwick procedure as applied to the Nassau County (N. Y.) demonstrations and the results obtained.

ROUX, ÉMILE. The Medical Work of Pasteur. *Scient. Monthly*, 21:365 (Oct.), 1925.

This paper, translated from the French by Erwin F. Smith, was written in 1896, being an excellent brief presentation of Pasteur's work, and probably as interesting as when it was first written.

SANDERS, E. M. Training Teachers to Teach Health. *Am. Phys. Ed. Rev.*, 30:378 (Sept.), 1925.

"In training teachers to teach health, the program should include three clearly defined activities, namely: some form of student health service, healthful surroundings and courses of instruction."

WITHINGTON, PAUL R., and BIGELOW, GEORGE H. The Milton Experience with Anti-rabies Inoculation of Dogs. *Boston M. & S. J.*, 193:552 (Sept. 17), 1925.

An account of the procedure adopted by the Milton, Mass., Board of Health to prevent rabies and the results accomplished. Authors conclude that immunizing dogs against rabies is apparently a safe procedure.

YOUNG, C. C., and CROOKS, MINNA. Laboratory Diagnosis in Throat Infections. II. The Direct Smear as an Aid to Diagnosis. *J. Lab. & Clin. Med.*, 10:1007 (Sept.), 1925.

Report of the findings and direct examinations of throat swabs and their significance. Illustrated by microphotographs.

LABORATORY

C. C. YOUNG *

Complement Fixation Reaction in Tuberculosis—This extensive study covers the whole realm of complement fixation in tuberculosis. A brief outline follows:

I. *Résumé of Previous Work.* Under this heading is reviewed the work of different authors. The first complement fixation test in tuberculosis was attempted by Bordet and Gengou in 1903. Since that time there has developed an extensive literature in this field. The authors summarize this literature in tabular form and thus make it readily available.

II. *Preparation of Immune Serum for the Standardization of Antigens.* Authors observed that the production of complement fixing substances in different animals varies with the species of the animals as well as with the method of inoculation and with the material inoculated. Horses receiving large doses of living tubercle bacilli intravenously developed high titer serums within a short period after inoculation. For practical reasons immune horse serum was employed in antigen standardization.

III. *Preparation of Antigens.* Both the culture filtrate and the bacterial residue of glycerin broth cultures of tubercle bacilli possess antigenic properties. These properties are associated with acetone insoluble lipoids. Differences in the method of preparation of antigen greatly modified the antigen activity. This difference in activity is due largely to the concentration of antigenic substances resulting from the method of preparation. Antigens possessing a high lipoid content gave a considerable number of positive reactions with four-plus Wassermann serums. Removal of acetone soluble material from these preparations largely eliminated these non-specific reactions. Three antigens were chosen for the development of a practical test: (1) dialized distilled water extract antigen, (2) purified and concentrated aqueous extract antigen, and (3) purified and concentrated culture filtrate antigen.

IV. *The Complement Fixation Test and Its Application.* This test is highly quantitative and ranges from negative to twelve-plus. Nine tubes (aside from control tubes) are employed with each of the above three antigens for a given test.

Authors studied 574 cases. Of these, 171 were clinically tuberculous and 403 control cases of miscellaneous diseases. Authors believe that this number is not sufficient to afford a basis for reliable statistics. "Nevertheless, the large number of reactions obtained with the serum of cases of pulmonary tuberculosis, approximately from 80 to 95 per cent in the Albany and Belleview series, the comparatively few reactions that occurred with non-tuberculous serums, not only demonstrated the practical value of the test as an aid in diagnosis, when interpreted in the light of careful clinical observation, but also, suggest the possibility of prognostic significance as experience accumulates and is correlated with bedside observation." Authors state that further studies are in progress.—A. Wadsworth, F. Maltner, and E. Maltner, *J. Immunol.*, 10:241 (Jan.), 1925. R. L. K.

The Action of Hepatic Extracts on Complement—Pancreatic extracts acting upon whole guinea pigs serum first destroys the end piece component of complement. As the reaction is allowed to proceed, the mid-piece component is also destroyed. The destruction of complement action by pancreatic enzyme runs parallel to the destruction of complement action by heating at 56° C.—A. Wormall, H. R. Whitehead, and J. Gordon, *J. Immunol.*, 10:587 (May), 1925. R. L. K.

The Antigenic Properties of Extracts of Horse Dander—I. Active Sensitization of Guinea Pigs to Horse Dander Extracts. Guinea pigs may be sensitized to extracts of horse

* Each month we desire to publish in the LABORATORY NOTES short, original articles, under the author's name, dealing with some phase of applied bacteriology, labor saving devices, modified methods, etc. Contributions should be in the hands of associate editor before the 15th of each month.—C. C. YOUNG, Department of Health, Lansing, Mich.

dander that contain a total nitrogen content of approximately 40 mgm. per 100 c.c. This sensitization is specific for the antigen or antigens that are contained in the extract of horse dander, for guinea pigs sensitized to horse dander extract do not react to horse serum, while guinea pigs sensitized to horse serum do not react to horse dander extract.—W. T. Longcape, D. P. O'Brien, and W. A. Perlzweig, *J. Immunol.*, 10:599 (May), 1925. R. L. K.

A Study of Agglutinable Antigens of Bacillus Influenzae—I. Methods of Preparing and Preserving Antigens of *B. Influenzae* and Their Effects Upon Specific Agglutination. Of the methods tried for the preparation of antigens of *B. influenzae* for agglutination, the following gave best results: The bacteria are grown on heated blood agar, washed off with small amount of normal saline, heated to 87° C. for one hour, made up in normal saline and stored in the refrigerator without preservative. Agglutination results are sharper when serum dilutions are made in beef infusion broth, pH 7.6, than in normal saline or in Ringer's solution.—M. J. Evans and J. C. Small, *J. Immunol.*, 10:613 (May), 1925. R. L. K.

Preparation of Media for Filtration—In the preparation of solid media such as agar and gelatin made direct from meat infusion, the procedure of filtering will require a great deal of time, when the media in question has not been prepared properly to begin with. Recent articles seem to elaborate on different methods of filtering and devices used in conjunction therewith but fail to lay stress upon the importance of proper clarification before the filtration begins. The finely divided insoluble matter which gives agar and gelatin an opaque appearance can be removed in no better way than by coagulation. The coagulant made use of is the coagulable proteid matter contained in the meat infusion.

Method of procedure:

I. The agar or gelatin should be dissolved, and added to the meat infusion, then heated to the boiling temperature, and continuing until the precipitation is complete. This should be carried out while the media still has its original acidity, and the adjustment to the desired reaction should be done only after the coagulation of all acid proteids.

II. After adjusting the reaction, again heat the medium to the boiling temperature, in order to coagulate any proteids which require a different H-ion concentration for their precipitation.

III. Next, the media in a container should be placed in an autoclave, and subjected to a pressure of 15 pounds for 15 minutes. This has the tendency of forcing the coagulated material to the bottom, after which the supernatant media can be passed through a filter with comparative ease.

Observance of these points will facilitate the filtration of media, giving a product free from insoluble matter, and also eliminate the danger of further precipitation after the final sterilization.—A. C. Janzig, Chemist, Minneapolis Filtration Plant. *Personal communication.*

Certain Factors in the Flocculation Test for Syphilis—The object of this paper is to record certain observations which have been made with regard to the essential factors in the flocculation phenomenon obtained with syphilitic serum and a lipoid "antigen." The main factors investigated were (1) heated serum versus fresh serum, and the temperature of heating the serum; (2) age of serum, *i.e.*, the time elapsing between the withdrawal of the blood from the patient and the carrying out of the test; (3) shaking the mixtures of serum and antigen; (4) relative amount of antigen and serums; (5) temperature of incubation. The conclusions show that (1) the sera should be heated to 54° to 56° C. for half an hour and unheated serum should not be used; (2) after the mixtures of diluted serum and antigen are made the tubes should be shaken for 5 minutes; (3) readings should be made after shaking and at intervals up to 24 hours; (4) where the serums cannot be tested until several days after withdrawal of blood negative results are of no significance and the Wassermann reaction must be used; (5) the flocculation reaction is easily carried out as compared with the Wassermann reaction.—H. Ferguson Watson, *J. Path. and Bacteriol.*, 28:171 (Apr.), 1925. L. W. G.

Time of Combination of Diphtheria Toxin with Living Tissues—The intradermal injection of a small quantity of diphtheria toxin into a guinea pig is followed by a definite inflammatory area around the point of injection. The time of appearance of the reaction is no indication of the time elapsing between the injection and the fixation of the toxin by the living tissues, as determined by the subcutaneous and

intravenous injection of antitoxin. The experiments tend to show that if a Schick dose of toxin be given intradermally neither 10,000 times its equivalent in antitoxin injected intravenously 15 minutes later, nor 1,000,000 times its equivalent in antitoxin given 30 minutes later is sufficient to prevent the appearance of a small reaction. The size of the reaction is reduced if 1,000 units of antitoxin be injected intravenously 2½ hours later or intramuscularly 1¾ hours later, but the subcutaneous injection of antitoxin 15 minutes after the injection of toxin fails to reduce the size of the reaction produced. If a Schick dose of diphtheria toxin be given to an immune rabbit it will act as a secondary stimulus causing an increase in antitoxic titer of the blood even though 1,000 units of antitoxin be given intravenously 3 hours after the injection of the toxin.—A. T. Glenny and Barbara E. Hopkins, *J. Path. Bacteriol.*, 28:261 (Apr.), 1925. L. W. G.

Progress in Pediatrics—Diphtheria—A Review of the Literature for 1924.—When antitoxin is given subcutaneously, the maximum concentration of antitoxin in the blood is not reached for about three days, while when given intramuscularly the maximum blood concentration is reached within twenty-four hours. Antitoxin may be given intramuscularly with no greater difficulty than subcutaneously. The difference in speed of absorption by these two routes is so great that in many instances it may determine between life and death for the patient. The subcutaneous is the route of choice for prophylactic injections, but for therapy this route should never be used. Antitoxin given peritoneally is said to be absorbed more rapidly than when given intramuscularly and with no more reaction. This route has not yet been used in a sufficient number of cases to demonstrate its safety, though there are no *a priori* grounds for assuming it unsafe.—T. T. Crooks, *Am. J. Dis. Chil.*, 30:397 (Sept.), 1925. H. C. H.

Obscure Lesions of Normal Rabbits—Following a previous paper on the organ weights of normal animals, the authors have studied the effects of obscure lesions of otherwise normal rabbits upon the organ weights. Significant variation from the normal was noted only in a few instances.—Brown, Pearce, and van Allen. *J. Exper. Med.*, 42:163 (Aug.), 1925. M. S. M.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Changes in Typhoid Fever Mortality at Various Ages—In the decade 1860–1869 the Massachusetts typhoid fever death rate, by ages, showed three points of maximum mortality—in early childhood, in early adolescence and in old age. The maximum points increased with advancing age; the first point, in the age period under five years was 70.8 per 100,000; the second point in the age group 15 to 19 was 121.3 and the third and highest point occurred in old age, 80 years and over, 290.0 per 100,000. With the passage of time the rates at both ends of the life span declined faster than the rate at the adolescent ages, and in the decade 1910 to 1919, the figures for the age period under 5 years was 2.1 per 100,000; that for the age division 80 years and over was 2.3 per 100,000.

A somewhat similar change in the age contour of the typhoid fever curve was observed in Glasgow from 1867 onward. Dr. Picken ascribes the phenomenon in Glasgow to the marked diminution in the hazard of domestic typhoid fever. Sixty years ago domestic sanitation in cities was decidedly faulty. Children and old people confined to the home were exposed to a considerably heavier risk of typhoid fever than were persons engaged in more active pursuits outside the home. Steps were taken shortly after the 70's to install adequate systems of water supply and sewerage, and still later to prevent the pollution of sources of water and milk supply. Along with this work went improvements in the treatment of typhoid fever, the practice of concurrent disinfection of discharges, the supervision of contacts, and antityphoid vaccination. These measures which followed the domestic sanitation movement contributed largely to the decline in the typhoid

fever death rate in adult life. Between 15 and 30 years of age in Massachusetts the rate ranged from 100 to 120 per 100,000 in the decade 1860–1869; in the years 1910–1919, the rate was around 10 per 100,000. Substantial progress has been made, of course, since that time.—*Stat. Bull.*, Met. Life Ins. Co., 6:7–8 (July), 1925.

The **Tuberculosis Survey of School Children in Alberta, 1924**—Of 1,051 children tuberculin tested in 8 different representative districts of Alberta, the positive reactors were 144, or 13.7 per cent. The percentage of reactors increased with age. The 2 larger cities had the largest number of reactors, *i.e.*, 18 per cent respectively. The Alberta born children show approximately one-half as many reactors as did those born elsewhere. It was of interest to find that in the so-called drought area, where economic conditions have been severe for years, no increase in reactors was found. In fact, the children quite equalled in general healthy appearance those found in more prosperous districts. Those found to have active tuberculosis were 6 or 0.6 per cent. Of 85 Indians examined 91.8 per cent reacted. It will be seen that fewer reactors were found than reported in other provincial surveys.—A. H. Baker, *Canad. M. A. J.*, 15:816–817 (Aug.), 1925.

Suicide **Record in 1924**—The crest of the suicide rate in the United States was reached in 1908, when the rate for American cities reached 21.5 per 100,000. It declined slightly after that, but during recent years the rate has remained about the same, about 15 per 100,000. The lowest rate was reached in 1920, when it fell to 12.3. It seems that to a measurable degree the suicide is affected by business conditions and that it is a rough indication of our national prosperity, although countless other influences and conditions determine its rise and fall.

In the Registration Area suicides have decreased from a rate of 15.4 per 100,000 in 1910 to 11.4 in 1920. There are few suicides under 15 years of age, numbering 24 between 5 and 14 years in 1920 and 30 in 1910. At ages 15 to 44 the rate was 11.9 in 1920 against 16.4 in 1910. The rate is higher for males than for females, or respectively for 1920 it was 16.3 at all ages for men and 6.3 at all ages for women. These rates, however, apply only in the Registration states of 1910. If the rate is broken up for 1920 it appears that suicides by poison for both sexes were at the rate of 1.7 per 100,000; suicides by asphyxia at the rate of 1.3; by strangling 1.2; by drowning 0.8 and by firearms 3.6.

The suicide rate in 100 American cities is given for 1900–1920, in 95 cities for 1921, and in 80 cities for 1922 to 1924. The rate is seen to increase rapidly from 15.4 in 1900 to 21.5 in 1908, to decrease slowly to 20.8 in 1915 and since then to fall gradually to a minimum of 12.3 during 1919, rising since then and falling during recent years until at the present time it is 15.3. In 1924 San Diego leads all cities with a rate of 45.2. This is followed by San Francisco 37.8, Los Angeles 32.8 and Oakland 29.9. Cities with low rates of suicide for 1924 are Elizabeth 4.7; Bayonne 4.6; and Newton, Mass., 6.1. There were no deaths from suicides in Petersburg, Va.—F. L. Hoffman, *Spectator*, 115:3–4, 11 (July 30), 1925.

Certain Phases of Infant and Maternal Mortality in North Carolina—A study of statistics of infant and maternal mortality in North Carolina for 1920–1922 made for the Bureau of Maternity and Infancy, shows that the number of infant and maternal deaths is influenced by the attendance of physicians in childbirth. In the state as a whole physicians attended 65 per cent of the cases of childbirth. In the 62 counties which had a lower infant and maternal mortality than the state average, the percentage of attendance at childbirth by physicians was 67. On the other hand, in the 38 counties with higher infant and maternal mortality reports than the average physicians attend only an average of 52 per cent of the childbirths.

There is an average of 1 maternal death for every 154 births in North Carolina for this period, or 1 maternal death to every 60 deaths. There is 1 stillbirth for every 20 births.—R. P. B. Bonner, Pamphlet issued by N. Carolina State Board of Health, July, 1924.

Infant Mortality in Porto Rico—The infant mortality and the birth rates are high in Porto Rico. While the infant mortality for the United States Registration Area was 101 in 1918 and 48.4 in New Zealand, Porto Rico had a rate of 142 for the fiscal year 1918–1919. In 1923–1924 the rate was 128. Gastro-intestinal diseases produced the greatest number of deaths, followed by diseases of early infancy and those of the respiratory apparatus. These 3 groups aggregate 75 per cent of all the infant mortality. The 5 principal causes of death, in their order of importance are as follows: diarrhoea and

enteritis; congenital debility; acute bronchitis; infantile tetanus and rickets.—A. F. Isern, *Porto Rico Health Rev.*, 1:3 (July), 1925; ab. *Jour. A. M. A.*, 85:516 (Aug. 15), 1925.

Diarrhea and Enteritis, American Cities, 1900–1924—There is perhaps no better evidence of a substantial advance in standards of American family life than the figures which show the effect of parental intelligence and of enhanced family well-being upon the death rate of young children. Among children under 1 year of age in the United States Registration Area in 1900, nearly 17 per cent, or about one-sixth, died before reaching the second birthday. In 1922, the mortality among these babies was 8 per cent. Two decades ago, more than 2 per cent (2.1) died each year at the ages between 1 and 5 years. In recent years, this death toll has declined to much less than 1 per cent (.7) of this child population each year.

Perhaps the best evidence of an advance in standards of child care is the declining death rate for diarrhea and enteritis. The diseases included under this heading in mortality statistics are, for the most part, due to the improper care and feeding of children. The modern infant is only one-fifth as likely to die of some intestinal disease as was the baby who lived two decades ago. In 1900, in 23 American cities, the diarrhea and enteritis death rate was 154 per 100,000 of population; in 1924 the figure was 29 per 100,000.

The trend line shows that progress was slow during the early years of this century. For the first 8 years, there was a fall of only 10 points in the death rate. Beginning with 1908, however, the country-wide extension of child hygiene precepts and practices, as put into effect by the departments of health of the states and of their minor civil divisions, began to affect the death rate appreciably. From 1908 onward, there was a rapid downward sweep of the line representing death rates for diarrhea and enteritis. Computing from the trend line, there was a fall of 78 per cent in the diarrhea and enteritis death rate between 1908 and 1924. An estimate from a continuation of the trend line suggests further progress during the next few years until a mortality of approximately 10 per 100,000 is reached in 1930, with not much decline from this rate for ensuing years.—*Stat. Bull.*, Met. Life Ins. Co., 6:3 (Aug.), 1925.

Infant Mortality. Cities in the Birth Registration Area, 1924—The infant mortality rate in the cities of the United States for 1924 reached the lowest point ever attained, according to the infant mortality report published annually by the American Child Health Association. The combined rate for 629 cities in the birth registration area was 72.2 as compared with a rate of 78 for 1923. The lowest rate of the cities in this area is credited to New Philadelphia, Ohio, whose rate was 25. Of the cities with a population of 250,000 and over, Seattle had the lowest rate, 45; Minneapolis and Portland, Oregon, followed with rates each of 54. In the group with populations from 100,000 to 250,000, Cambridge had the best record, with a rate of 42; in the group with 50,000–100,000 population, Long Beach, California, stands first with a rate of 41.—*Stat. Rep. Inf. Mort., 1924*, American Child Health Association, June, 1925.

The Health of Cape Town—The year 1924 has been a satisfactory one from the public health point of view. There has been a very evident decline in the incidence of enteric fever. The number of cases for the year ending June, 1924, was 214 as compared with 379 in 1922–1923 and 504 for 1921–1922. The incidence rate is practically the same for Europeans and non-Europeans, but the enteric death rate for the latter class is distinctly more than double that for the former. Diphtheria was more prevalent than usual and greatly exceeded the incidence of scarlet fever, there being 212 cases of the former as compared with 29 of the latter. Measles and whooping cough were very prevalent, the periodical rise of each happening to fall within the year under review. The death rate from measles was .18 per 1,000 for Europeans and 1.37 for non-Europeans, and the death rate from whooping cough was .19 for Europeans and .82 for non-Europeans.

The death rate for the city of Cape Town and its suburbs was 9.87 for Europeans and 30.23 for non-Europeans. The infant mortality for the latter class was about two and one-half times as great, 72.5 for Europeans and 188.0 for non-Europeans. The birth rate among the Europeans continues to decline and is now the lowest ever recorded, 21.92. On the other hand, the non-European birth rate reached the remarkably high figure of 52.66.—*Med. Off.*, 34:47 (Aug. 1), 1925.

Vital Statistics in Pennsylvania, 1917–1923—A study of the vital statistics in Pennsylvania for the years 1917–1923 shows that the death rate has had a downward trend, being 15.2 in 1917 and 13.3 in 1923. A few years, 1918, 1920 and 1923, have shown slight increases as compared with the preceding year but with the exception of the year 1918 the downward trend has not been halted. For each of these years the urban rates have been higher than the rural rates, but it should be noted that one-fifth of the deaths which occur in urban hospitals are drawn from the surrounding rural territory.

The continuous decline in typhoid fever, from 54.8 in 1906 to 4.9 in 1923, illustrates the achievements to be attained through the application of intelligent effort to secure pure water and milk, protected food and the proper disposal of sewage. Pennsylvania's death rate from tuberculosis, all forms, in 1906 was 151 per 100,000 of population. There was a gradual decline from this point until 1912, during which year the rate was 122. From 1913 to 1918 the rate increased until it reached 151. Since 1918 there has been a remarkable decline, the 1923 rate being the lowest recorded, 86.0. Cancer has gradually increased since 1906, the 1923 rate, 90.8, being the highest of the series.

If infant mortality rates are to be accepted as an index of consistent and persistent effort in the line of hygiene and sanitation, the decline between 1906 and 1923 is most gratifying. The rate has dropped from 167 to 88. The death rate from all puerperal causes per 1,000 live births was 6.5 in 1917 and in 1923, although it was higher for every year in the interim except 1922. The death rate from puerperal septicemia per 1,000 births has remained about 2.8.—Wilmer Batt, *Penn. Listening Post*, 3:2–15 (July-Sept.), 1925.

The incidence of Mastoid Disease in the United States—Yearly reports from 65 hospitals in different parts of the country were analyzed in order to find the geographical distribution of mastoid disease. Only figures from general hospitals, admitting all types of cases, have been used. Mastoid disease was found to be more than 3 times as common in the northern midwestern and New England states as in the far southern and far western states. The cases of mastoid disease per 1,000 admissions to hospitals were, respectively, 11.1, 7.4, 2.4 and 2.2. The middle Atlantic states occupy an intermediary position (5.9). No conclusions can be drawn from the relative numbers of acute and chronic cases admitted. At least two-thirds of the cases admitted in all localities were of the acute type. The cause for the variation in mastoiditis in different localities is not clear.—A. Blalock, *South. M. J.*, 18:621 (Aug.), 1925.

Seasonal Incidence of Waterborne Typhoid Fever—Waterborne typhoid fever shows its maximum incidence at the colder seasons of the year; typhoid fever, spread through foods or by contact, has its point of maximum incidence in warmer weather. This is shown by an analysis of the typhoid fever data of Philadelphia, Pa., during the last 25 years. The seasonal index for typhoid fever has been worked out, first for the period 1899–1907, when most of the cases of the disease were traceable to polluted drinking water, and, second, for the period 1914–1924, after the water hazard had been very greatly mitigated.

During the period when waterborne typhoid had widespread prevalence in Philadelphia, the rate was from 20 to 40 per cent in excess of the mean rate for the year during the months of January to May. The minimum rates during warm weather were from 10 to 35 per cent below the mean annual figure during the months June to November. After adequate measures were taken to protect the Philadelphia water supply, the maximum rates occurred in the summer and early fall and minimum rates in the winter and early spring. The somewhat irregular contour of the seasonal curve during the 11-year period 1914–1924 is due to the comparatively small number of deaths recorded, an average of 79 per year, as compared with an average of 752 per year for the earlier period when the water hazard was heavy.

For the years earlier than 1899, the seasonal index has been computed for 2 groups of years, 1862–1881 and 1882–1898. During the first period there was a summer-autumn peak in the curve and also a not very pronounced winter peak, centered in December. The second period (1882–1898) resembled the first, but exhibited a winter peak centered in January.

The curve for the last period, 1914–1924, resembles the curve for the first period, 1862–1881, but the summer-autumn peak is more accentuated and the winter peak is less evident. The resemblance may be due to the fact that prior to 1881 the water for the city was taken largely from private wells, which were less contaminated than the public water supply used in later years.—*Stat. Bull.*, Met. Life Ins. Co., 6:5 (Sept.), 1925.

SANITARY ENGINEERING

ABEL WOLMAN, C.E.

Metropolitan Milk Supply, Western Australia—In a preliminary survey of the bacterial condition of the metropolitan milk supply examinations were made of samples taken at various points between the cow and the consumer. Investigations were carried out in order to compare the results of hand-milking with those of machine-milking and to determine the influence and importance of various factors involved in the production of clean milk. The method of procedure and detailed findings are given. The conclusions are as follows: (1) Milk as delivered to consumers under existing conditions shows a high bacterial count; (2) milk produced at hand-milking dairies gives a relatively low count; (3) by the use of simple, inexpensive methods it was possible at a hand-milking dairy to produce milk of an extremely satisfactory degree of cleanliness, and to deliver it in the same condition; (4) sterilization of utensils can be accomplished by dipping in boiling water before use; (5) use of milking machines under existing conditions gives very unsatisfactory results; (6) results obtained by use of milking machines under very good conditions are no better than those obtained by hand-milking under ordinary conditions; (7) *b. coli* organisms are practically absent under the best conditions of hand-milking.—*Addendum to Report, Royal Commission on the Metropolitan Milk Supply, Western Australia*, 1925. A. W. B.

Iodization at Ilkeston and Heanor, England—Sodium iodide, at the rate of one pound per 6.72 U. S. m.g., is being added daily, as a goiter preventive, to the Ilkeston and Heanor water supplies. A method has been devised for a graduated supply by percolation through porous earthenware in reservoirs where no pump is in use.—*Eng. News-Rec.*, 95:380 (Sept. 3), 1925. A. W. B.

Wisconsin Supreme Court Enjoins Stream Pollution—A riparian owner was awarded $50,000 damages for the flooding of his celery farm together with the creation of a public nuisance in the waters of Honey Creek by raw and partially treated sewage being discharged into the stream by the city of West Allis. The court ordered the city to abate the nuisance within 60 days.—Wm. R. Copeland, *Eng. News-Rec.*, 95:390 (Sept. 3), 1925. A. W. B.

Better Recreation for Scranton—A cash appropriation of $80,000 by the City Council supplementing a previous private gift fund will provide swimming pools in three sections of the community. A gift of $150,000 will be expended for a large combination auditorium, gymnasium and indoor swimming pool.—Weaver Pangburn, *Am. City*, 33:170 (Aug.), 1925. A. W. B.

Extravagance and Waste in the Unplanned City—"The lack of a city plan invariably means official extravagance and waste. Urgent improvements may be ignored or unduly postponed. Less needed improvements too often follow one another in rapid succession. Ignoring the existence of city planning problems is not to solve them."—Herbert S. Swan, *Am. City*, 33:172 (Aug.), 1925. A. W. B.

Beauty as a Factor in City Development—Regulation by state legislatures is suggested as the most effective means of preventing natural beauty from being marred by bill-boards, overhead signs, dirty, filthy vacant lots, and old dilapidated buildings. Such regulations would also curb the construction of buildings unbecoming to the surroundings. "Those who live in a clean, healthy atmosphere think cleaner and live cleaner."—H. R. Ennis, *Am. City*, 33:177 (Aug.), 1925. A. W. B.

A 10.6 Per Cent Return on Investment in Small Water Plant—One year's operation of the new 2,000,000-gallon-per-day gravity filtration plant and equipment has indicated that investment in the improvements has netted a return of over 10 per cent besides improving the quality of the water.—M. P. Hatcher, *Am. City*, 33:251 (Sept.), 1925. A. W. B.

INDUSTRIAL HYGIENE

DRS. EMERY R. HAYHURST AND NELSON C. DYSART *

Accomplishments in the Control of Industrial Diseases (Plumbism and Silicosis) at the Broken Hill Mine, Australia—The metalliferous mines of Broken Hill are some 1,000 feet above sea level, 300 miles from the seacoast, in a portion of the continent with an average rainfall of 8 inches, a temperature range from 30 to 116° F., with a good climate, but with hygienic conditions not always so. Dust clouds prevail though the dust is well sterilized by sunlight. Flies are numerous, houses are poor—mostly of galvanized iron, and, as in most mining towns, merely temporary. Mining began in the district in 1883 and ores containing lead, zinc, silver and copper are taken out. The Broken Hill lode is of a large boomerang-shaped mass, the bend of the boomerang being uppermost, its center exposed above the surrounding country, while the ends reach 1,500 feet at the deepest levels. The ore contains about 50 per cent silica. In the period between 1898 to 1924 an average of 6,662 persons have been employed.

Ores near the surface are almost entirely carbonates and other oxidized forms of the metals. Smelting is no longer done in the vicinity. The deeper lying ores are in the form of sulphides. Because of the greater solubility of the carbonates, and of the smelting process, as well as the general lack of medical supervision, acute and sub-acute plumbism, even in extreme forms, was formerly not infrequent. In the earlier days silicosis was also prevalent. Largely on account of unhealthful conditions, a great strike took place in 1919, which has resulted in very changed conditions and results. Working time was reduced from 44 hours to 36 hours underground and 48 to 44 on the surface. Furthermore, a commission appointed to study the whole situation, made clinical and radiographical examinations of all the workmen. Their reports were published in 1921 and 1922. Briefly, the Technical Commission found that—

1. Pneumoconiosis resulted in Broken Hill miners.
2. Men affected with pneumoconiosis show a predisposition to pulmonary tuberculosis.
3. Dust hazard is capable of control.
4. Cases of plumbism occur amongst Broken Hill miners.
5. No hookworm occurs in Broken Hill mines.

In order to meet the recommendations of the commission, special acts of Parliament were passed (supplementing previous ones) in 1920 and 24. The 1920 act differs from similar legislation elsewhere in that pure pulmonary tuberculosis (*i.e.*, uncomplicated by any industrial disease) is compensable. This provision has arisen from the desire to remove all possible sources of infection from the employes. The act is limited in its application to those workmen employed in the mines when the "big strike" of 1919 occurred. The act is administered by a joint committee nominated by the employers and employes.

The Technical Commission concluded that dust can be minimized "to a degree where danger does not accrue to the worker" by the following means:

1. Adequate ventilation
2. Adequate use of water
3. Firing explosives at the end of a shift only
4. Preventing work in firing areas until dust has subsided.

The companies are interested in keeping conditions today as close to the optimum as possible, and the men are better educated to the necessity. However, strict supervision by the government mining inspectors is necessary to prevent transgressions by both sides. In the short time which has intervened, results as regards working conditions have been excellent so that Broken Hill today finds a very high place among the world's mining fields in regard to its hygiene and sanitation.

Cases of plumbism have been practically absent since the "big strike." However, a number

* The editors of this Section will gladly receive contributions from members. Please address all material to Hartman-Ohio Bldg., Columbus, Ohio.

of workmen exhibit evidence of chronic degenerations which can be ascribed to their association with lead (over years of time). There is now compulsory notification of lead poisoning, removal of susceptible persons, and complete control of all men in receipt of compensation for lead poisoning, with a view to treatment. A workman cannot return to work until certified by the Medical Board. Since its inception, May, 1923, the board has certified 62 cases of lead poisoning, 44 of whom (all chronic cases) were previously certified by a medical referee. Thus, 18 fresh cases have been found, 13 of which are chronic cases in employes with 15 to 32 years' exposure. Thus only 5 new cases, and showing symptoms of acute or sub-acute plumbism, have occurred. Attempts at medical examinations by the mining companies did not prove satisfactory, so that the Department of Labor and Industry set up a Bureau of Medical Inspection for the purpose. The bureau has established a list of afflictions and conditions from which an applicant for work must be free, at least to a degree such as to render him unlikely to be adversely affected by his work in the mines. The list includes:

1. All diseases of the bronchi, lungs, and pleura
2. All diseases of the heart which are demonstrable by ordinary clinical examination
3. Tuberculosis in any form
4. Venereal disease in an infectious form, or when producing a definite disability
5. Aneurism
6. Varicose veins with ulceration
7. Anemia, whether primary or secondary, in which the hemoglobin value is less than 75 per cent
8. Increased blood pressure, namely: a systolic blood pressure of over 150 mm. Hg. in a man under 30 years

A systolic blood pressure of over 160 mm. Hg. in a man under 40 years

A systolic blood pressure of over 170 mm. Hg. in a man under 50 years

9. All diseases of the kidneys, including albuminuria of renal origin
10. Gout
11. Lesions of the joints—(a) due to rheumatism proper, gout, or rheumatic gout (so-called); (b) due to disabling conditions arising from injury, loose cartilages, septic inflammation, or chronic synovitis.
12. Hernia, or the existence of a definite bubonocele
13. Chronic alcoholism or drug taking
14. Paralysis or paresis of muscles not of traumatic origin
15. Neuritis
16. Epilepsy
17. Plumbism
18. Defective vision or hearing, namely, vision of less than 6/12 in both eyes, or inability to hear ordinary conversation
19. Any marked disability resulting from previous injury or disease
20. Scurvy
21. Pyrrhoea alveolaris

During the two-year period ending June 30, 1924, 5,444 men were fully examined for employment, of whom 964 or 17.7 per cent failed to come up to the required standing. The chief causes for objection were respiratory, renal, and cardio-vascular disorders, comprising 83 per cent of the rejections. Some were rejected because of abnormal radiographic chest findings, even where clinical findings were otherwise passable. All persons with albuminuria except, in some cases, youths are rejected. Periodic medical examinations are, however, still necessary.—M. R. Finlayson, *Health*, Australia, III, 4:101 (July), 1925.

Prevention of Lead Poisoning—Some 7 or 8 years ago, Lewis Berger & Sons (Australia) decided to erect a factory near Sydney for the manufacture of white lead, paint and varnish. The directors recognized beforehand the potentially injurious character of the work to the health of employes. They erected an absolutely up-to-date hygienic factory and instituted medical examination of all employes. They have employed an average of 100 men, about 40 in the corroding department, 40 in paint manufacture, and 10 in the varnish department. Each employe has a locker, is given two changes of overalls per week, required to use wash basins and showers, and change soiled clothing as instructed, to take aperients regularly, and drink plenty of milk. Smoking is prohibited. Printed notices, masks for men in dusty work, vacuum dust collectors, medical examinations regularly once a week, and the keeping of health records have resulted in remarkable healthfulness of the employes. While admittedly exposed to health risks, they are in better condition and more hygienic in their habits than the average. For some men, cleanliness is among the traits undeveloped and unattainable—these men should be rejected. The chief dangers are in the cor-

roding sheds where men are changed about. Only 4 cases of lead poisoning have developed throughout the period and none in the last 2 years.

The average absence through sickness during the last year has been less than 1 day per man. The 4 cases of definite plumbism were all sub-acute and are interesting in respect to the question of diagnosis. The first, a foreman, had cleaned out several drying pans without wearing a mask as instructed. He had severe colic, obstinate constipation, and a slight blue line on the gums. The second, a corroder, showed no lead in the urine, no basophilia, the hemoglobin value was high, and there was no blue line on the gums, but he complained of back ache, general weakness and debility, some abdominal pain, lightning pains in the lower extremities, slight wrist drop, and wasting of the muscles of the forearms, and was very nervous. Since convalescing he has worked in the corroding shed for upward of two years with no recurrence. The third case, a corroder, had no headaches nor signs of encephalopathy, or paralysis or paresis, but after working for only a few weeks, he became anemic, had a blue line on the gums, attacks of severe colic, and a very bad taste in his mouth. After an absence of three weeks he was still nervous and decided to change his occupation. The fourth case had no colic, no constipation, no sleeplessness, no signs of paralysis, no blue line on the gum, no lead in the urine, and the blood picture was normal. He was also a corroder. After a previous attack of abdominal pain which proved to be ptomaine, he had severe backache, on the second occasion, with weakness in the legs and feet and anemia; his legs were thin, and his muscles poorly developed. He recovered; returned to work; and has improved in general condition. Doubt is expressed concerning the diagnosis in this case. Many of the men have been at the same job for years. The majority have shown no signs of lead absorption or lead poisoning. No doubt, they have developed a gradual tolerance to lead absorption. All these results are attributed to industrial hygiene which has been carried out by coöperative effort.—L. Halse Rogers, *Health*, Australia, III, 4:108 (July), 1925.

What is a Dangerous Quantity of Lead Dust in Air?—This old question has recently taken on new importance through the use of tetraethyl lead in gasoline. The manufacturers of ethyl gas have believed the amount of lead in gasoline to be so small that a negligible quantity of lead dust is suspended in the exhaust gas which has been diluted sufficiently to prevent carbon monoxide poisoning. Public health alarmists, on the other hand, have painted black pictures of wholesale lead poisoning to follow a widespread use of tetraethyl lead in our large cities. Officials who have administrative duties have grave misgivings but hesitate to act upon the basis of scanty and conflicting evidence. Duckering's analytical results, published in Legge and Goadby's book in 1914, places two mg. (1/30 grain) of lead as the lowest daily dose which, inhaled as fume or dust in the air, may in the course of years set up chronic plumbism. Knowing that a workman takes an average of 4.5 cu.m. of air into his lungs daily, and basing their opinion upon the above quoted daily dose, Legge and Goadby believe that if the amount of lead present in the air is less than 5 mg. per 10 cu.m., no encephalopathy or paralysis would occur, and cases of colic very rarely occur. Teleky of Vienna, working on a related problem, concluded that one mg. of lead taken dissolved and directly into the mouth or stomach daily would cause plumbism within several months, and 10 mg. would cause severe symptoms in a very short time. The U. S. Public Health Service, in its pottery survey reported in 1921, found that dangerous quantities of lead dust were in the air in 28.5 per cent of the rooms where tests were made; also that 22.8 per cent of the exposed employes were actually lead poisoned. The Palmer dust method used is too gross for efficiency and hence its findings were conservative in the tests made. If existing laws should be literally enforced compelling the removal of all lead dust in the air, it would close down every pottery in the country. Tests made by the writer indicate the same to be true of many other industries. The U. S. Bureau of Mines, in 1924, found that animals exposed to air containing 0.11 to 0.22 mg. of lead per cu.m. for 2 months (the same animals had previously been exposed for 6 months to lower concentrations) showed no symptoms of lead poisoning, although analysis of tissues and bones revealed minute traces of lead, showing that there had been slight lead absorption. The methods of chemical detection of lead were so perfected that it could be found before the symptoms of lead poisoning appeared. "Although the Bureau of Mines report has been criticized for lack of completeness, it is certain

that the report is a good deal better than many others on similar problems, and at least supplies confirmatory evidence concerning the minimal toxic dose that would cause chronic lead poisoning." Minot and Aub of Harvard University (final report not yet published) have shown that lead may be absorbed without symptoms, stored in the bones as a harmless deposit of lead phosphate, then, through some change in physical condition, thrown back into the blood stream in quantities large enough to produce symptoms of acute lead poisoning. Advantage could probably be taken of this phenomenon to bring about gradual elimination of lead from the body (without harm). It is just possible, also, that very small quantities of lead may be taken into and eliminated from the body under normal conditions without building up a lead storage. "If that is found to be a fact there would be no necessity for closing down all our lead industries on the basis of intolerable lead poisoning. It would only be necessary to install better protection in a few places where the limit is exceeded." In 1912, Graham-Rogers and Vogt of New York found that 22.2 per cent of 81 analyses of aerial lead dust exceeded Legge and Goadby's limit for poisoning, and the Public Health Service's pottery survey has therefore confirmed their data. In order to keep well away from the danger point, the writer suggests a figure as low as 0.2 mg. per cu.m. (equivalent to slightly less than 1 mg. inhaled per day with safety by the average worker).—C. M. Salls, *Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, II, 3 (Sept.), 1925.

Carbon Monoxide Poisoning—In the second part of his article on this subject, the author discusses the pathological findings, particularly in the brain, and states that he has seen the hemorrhagic encephalitis mentioned abroad in a very few cases. He is most familiar with the symmetrical areas of anemic necrosis in the *globus pallidus*, first described by Kolisko. There are many cases of chronic illness due to constant exposure to small doses which show anemia, headache and weakness, and an increased number of red cells at first. Many instances are recorded in which persons have accused themselves of having committed crimes when they were innocent, and *vice versa*. Others have wrongfully been accused of alcoholism. The author, with Dr. A. O. Gettler, has shown the importance of determining accurately the carbon monoxide percentage of saturation of the blood. Death dealing amounts must have individual variations. Using the delicate method of Van Slyke as modified by O'Brien and Parker, which is accurate to 1 per cent, the authors found that 64 per cent of normal cases have CO present in the blood when death is due to other causes than carbon monoxide. These percentages ran from mere traces up to 5 per cent (a fireman). In deaths due to carbon monoxide (the victims found after varying periods after exposure, etc.), the CO present ranged from 10 to 92 per cent. Following fires large amounts are usually found. In dead bodies, where post-mortem settling has occurred, the cherry red discoloration of the skin and viscera may be said to be almost as sensitive a test as Hoppe-Seyler's dilution test which, the two authors find, is sensitive to within 10 per cent. The authors give a table showing the sensitiveness of 29 various carbon monoxide tests.—Charles Norris, *Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, II, 2 (Aug.), 1925.

Very Misleading Post Mortem Appearances Resembling Carbon Monoxide Poisoning—In a much controverted case regarding whether or not the victim, a furnace man, died of carbon monoxide poisoning, the authors discovered, post-mortem, a nitrifying organism which caused the body to have a red color, similar to that often found in CO poisoning. The case would probably have been allowed compensation as a carbon monoxide victim except for the fact that he lived for nine days after he became ill while at work, becoming very cyanosed at the end, and the red color appearing after death. This made it highly improbable that the discoloration could be due to CO after so long a period of withdrawal from exposure. The man's symptoms began with faintness and inability to stand, and to walk more than a few yards even after a rest. His skin was cold, he was very feeble, and during the night coughed up blood-stained sputum. His pulse was feeble, his breathing heavy, his temperature normal, and he complained of a feeling of compression in the chest, so that CO poisoning was suspected. His symptoms continued, including blood stained sputum to the last, when death occurred within 10 minutes. The only cause which is known to be capable of producing the red color of the blood and the other reactions which were found is the presence of *nitric-oxide-hemoglobin*. This can be differentiated

from CO-hemoglobin by the fact that on great dilution with water, CO-hemoglobin appears pink. This is by far the simplest and most delicate means of detecting the presence of CO in the blood, while NO-hemoglobin on similar dilution is not so pink, and boiling gives a pink coagulum, while CO-hemoglobin (also O-hemoglobin) give a dull grey coagulum. This difference is due to NO-hemochromogen's being stable in the boiling water and of a red color. The spectroscopic test will not differentiate. It has already been shown by Haldane *et al* that animals killed after receiving a dose of a nitrite show blood of bright red color after death and the possibility of this being mistaken for CO-hemoglobin was pointed out in the *Journal of Physiology* in 1897 (Vol. XXI, p. 160).—Banham, Haldane, and Savage, *Brit. Med. J.*, Aug. 1, 1925, p. 187.

Carbon **Monoxide Poisoning—A Delayed Fatal Case**—Thorne's patient, a male aged 42, gave a lecture and demonstration of an automobile engine in a room after which he left for home. Shortly after reaching the fresh air he felt weak and quite ill but managed to take a street car, remain on the platform in the air, and stagger up the stairs to his home. Thorne saw him shortly after when he was in bed, very weak, skin cold, and complaining of air hunger. Color rather pale. Said he could not take a breath deep enough to satisfy. Pulse weak, about 80. Temperature sub-normal. Examination of lungs negative. Temperature at noon the next day was 101 and later increased to 102 2/5, no cough, pulse 100, respirations normal, pain in lower chest on deep inspiration. In 48 hours after exposure he had free bloody expectoration with frothy mucus, but no cough except on clearing his throat. On the third day, signs of pneumonia of bronchial type but with limited areas of consolidation developed. He was never cyanotic until shortly before death. The blood count showed white cells 15,200, hemoglobin 70–80, blood red and clotted well. Patient died on the fifth day, having developed hiccough and edema of the lungs. (May this not have been a case of NO-hemoglobin similar to the one described above by Banham, Haldane and Savage, and due to a nitrifying micro-organism concerned in the pneumonia present? It is certainly unusual to find a case of carbon monoxide poisoning growing worse after removing from the place of exposure upon his own volition and abilities. Almost invariably, inability to move or unconsciousness occurs in victims who later die from the effects of CO gassing.—E. R. H., abstractor).—J. M. Thorne, *Pittsburgh Med. Bull.* (Mar. 7), 1925.

American Chemical Society's Committee Reports on Occupational Diseases—Chemical manufacturers should keep themselves informed on the hazards involved in their particular lines of goods and should establish better contacts with state health departments and industrial hygiene boards. An exhaustive résumé of literature on the subject was presented. Additional causes or items, it was suggested, should be added to compensation lists of occupational diseases. It is believed that the number of immediate deaths is not large but the indirect effects curtail the efficiency of workers in these trades. The New York Department of Labor's method of disseminating information, etc., is commended; also, the fact that colleges are laying more stress upon the hygienic aspects of the chemical industry.—L. W. Fetzer, Chairman, et al., *Ind. & Eng. Chem.*, 17, 6:654 (June), 1925.

FOOD AND DRUGS

HARRY W. REDFIELD, PH.D.*

COMMENT

Vitamin A Isolated?—Dr. Edwin F. Slosson, science service expert of Washington, reports that it has fallen to the lot of a Japanese chemist to finally segregate, and identify "Vitamine A."

The Slosson statement relative to this interesting discovery is reprinted herewith in part as follows:

"At last, however, the problem appears to have been solved, and Japan may get the honor of isolating 'A.'

"Patsumi Takahashi and other investigators, working in the laboratory of Prof. U. Suzuki in the Institute of Physical and Chemical Research at Tokio, report having extracted and analyzed vitamine A from cod liver oil, spinach and green laver, a kind of seaweed. It comes out finally as a yellowish red oil, transparent and viscous with a characteristic but not disagreeable order resembling somewhat the yellow matter of carrots and green leaves.

"They have called it biosterin, because it resembles in composition and behavior the already known cholesterin, which occurs commonly in plant and animal cells, although its function is still a mystery.

"One of the interesting properties of biosterin is that it will print its image on a photographic plate in the dark—that is it acts like radium in giving off some active rays.

"The effect of biosterin in minute quantities on the vital processes is most amazing, a daily dose of no more than a millionth of a gram being sufficient to keep up the growth of young rats that were fed on a diet so deficient in this vitamine that they would otherwise stop growing and die."

The Turbidity Test—Due to court actions in New York City, in which butter has been alleged to be adulterated with foreign fat, as shown by the turbidity test of Seidenberg, much interest in that method has recently developed. Seidenberg published an article in the September 9 issue of the *New York Produce Review and American Creamery*, page 700, in which he gave the results of experiments in which cows were fed with increasing amounts of cottonseed meal in the ration. He analyzed the cream and found that while the usually determined constants of the fat were affected not at all, or only slightly, the turbidity figure was quite markedly affected. From this he concludes that foreign fat has been introduced into the cream and would be present in butter made from such cream, and claims adulteration through the medium of the cow. By a process of reasoning, he endeavors to prove that this would be detrimental to persons eating the butter because of lack of vitamin A. It is noteworthy that he did not put his theory to the obviously necessary test of feeding experiments with this alleged adulterated butter to determine whether it was deficient in vitamin A, as compared with other butter in which he found no such adulteration. If not taken too seriously, the article is well worth reading.

Dr. Ransom Passes Away—Dr. Brayton H. Ransom, Chief of the zoölogical division, Bureau of Animal Industry of the United States Department of Agriculture, died in Washington on September 17. In 1902 he became assistant in the zoölogical division of the Hygienic Laboratory of what was then the Public Health and Marine Hospital Service; after one year transferring to the Bureau of Animal Industry. He became famous in the field of parasitology and contributed the carbon tetrachloride treatment for hookworm to human medicine.

ABSTRACTS

Problems of Food, with Special Reference to India—This general discussion of nutritional problems is based upon the author's observations and investigations in India, which have been noted previously from various sources. Of particular interest is the discussion of the remarkable difference in the physical

* Address all comments, notes and suggestions to 641 Washington Street, New York City.

efficiency of the various races of India, differences which can be traced chiefly to the dietary habits of these races. The races showing the highest degree of physical efficiency are those whose diets are largely lactovegetarian. In commenting upon these observations, the author suggests that "if a closer study of the food habits of different races of mankind were made, we should find as much material on which to base sound judgments as to the origin of many common diseases as we now find within the four walls of the best equipped laboratory."—R. McCarrison, *J. Roy. Soc. Arts*, 73, 3763:137–153, 1925.

The **Oxidation of Cystine and Cysteine in the Animal Organism**—In an attempt to determine which groups in cysteine and cystine are attacked on oxidation in the body, rabbits were fed or given subcutaneous injections of a number of cysteine and cystine derivatives in which 1, 2, or all of the 3 sensitive groups ($-NH_2$, —SH, and —COOH) were protected by some aromatic radical, and the amount of the substances oxidized was determined by analyses of the urine.

Oxidation was not prevented by the blocking of any of the groups alone, but was completely prevented by the simultaneous blocking of the amino group and the sulfur group, showing these to be the vulnerable points. The data are also thought to furnish evidence that cysteine and cystine are mutually convertible in the animal body.—A. R. Rose, G. J. Shiple, and C. P. Sherwin, *Am. J. Physiol.*, 69, 3:518–530, 1924.

Do **Edible Mushrooms Possess Antiscorbutic Properties?** (trans. title)—Two varieties of mushrooms, Cantharellus cibarius (chanterelle) and Psalliota campestris, were found to possess no antiscorbutic properties.—H. Steidle, *Biochem. Ztschr.*, 151, 3–4:181–186, 1924.

Inactivating Action of Some Fats on Vitamin A in Other Fats—In this investigation conducted at the University of Copenhagen, evidence was obtained from feeding experiments with young rats that certain fats when intimately mixed with butterfat destroy the vitamin A of the butter. Of the fats tested, a sample of hydrogenated whale oil and lard which had been heated in thin layers in the air possessed this property, while hydrogenated cocoanut oil, hydrogenated hemp-seed oil, and nonhydrogenated cocoanut oil did not inactivate vitamin A. That the failure of the animals to grow when fed the mixture of hydrogenated whale oil or lard with butter was not due to a toxic action was shown by the normal growth resulting when the same fats were fed separately.

Attention is called to the possible bearing of these results on the interpretation of previous vitamin A experiments and on certain problems of cooking, such as frying foods containing vitamin A.—L. S. Fridericia, *J. Biol. Chem.*, 62, 2:471–485, 1924.

Dietary Requirements for Reproduction—III. The existence of the reproductive dietary complex (vitamin E) in the ethereal extracts of yellow corn, wheat embryo, and hemp-seed.—In continuation of the investigation previously noted, evidence is presented that the ether extracts of yellow corn, wheat embryo, and hempseed contain the dietary factor essential to reproduction, designated by the author as vitamin E and by Evans and Bishop as vitamin X. From 3 to 5 per cent of the oil was found to be sufficient to prevent reproductive failure. Fertility was also secured with 5 per cent of commercial cottonseed and olive oils, but not with commercial cocoanut, linseed, or sesame oils.

In connection with these experiments, it was also demonstrated that the amount of vitamin B required for the normal function of the mammary gland is greater than that for growth. A change from 0.4 to 0.5 per cent of Harris yeast powder as a source of vitamin B was in some cases sufficient to secure normal lactation and rearing of the young on diets which had been found adequate for reproduction but not lactation. In much of the work the entire protein of the ration was furnished by skim-milk powder to the extent of from 35 to 50 per cent of the ration. It is concluded that skim-milk powder, when fed to this extent, furnishes amino acids sufficient in quantity and of excellent quality for reproduction. The only mineral supplement found necessary was 0.2 per cent of ferric citrate.—B. Sure, *J. Biol. Chem.*, 62, 2:371–396, 1924.

Relation of Natural Foodstuffs and Their Treatment on Growth and Reproduction—In connection with previously reported work on potassium in nutrition, evidence was obtained confirming the conclusion of Evans and Bishop

that wheat embryo contains a dietary factor other than vitamin B, which is essential for reproduction. Corn was found to contain this factor and to lose it on extraction with cold water and drying at a temperature not exceeding 100° C. The factor was present in wheat embryo, the alcoholic extract of wheat embryo, and green kale, but was absent from yeast.—H. G. Miller and W. W. Yates, *J. Biol. Chem.*, 62, 1:259–268, 1924.

Ophthalmia as a Symptom of Dietary Deficiency—To supplement an earlier report on the incidence of ophthalmia in rats on diets deficient in vitamin A, the authors, with the collaboration of H. C. Cannon, have examined the records of about 4,000 of their rats (numbers 6,000 to 10,376). Of this number 493 received diets containing little or no vitamin A and were under observation 20 days or more. Ophthalmia was recognized in 297 of these animals, or 60 per cent.

Further subdividing the 493 rats according to the nature of the diet, in the group of 114 on the most highly purified diets, 94 showed positive eye symptoms. In this group, in 88 animals receiving edestin as the protein the incidence of ophthalmia was 83 per cent, in 23 receiving casein purified by extraction with fat solvents 80 per cent, and in 3 on extracted meat residue 100 per cent. That the eye disease was not the result of unsatisfactory proportions of the salt constituents, suggested by McCollum, Simmonds, and Becker as occasionally being responsible for this trouble, was shown by the high incidence of ophthalmia, 84 per cent, among 64 rats receiving a salt mixture known to be adequate.—T. B. Osborne and L. B. Mendel, *Am. J. Physiol.*, 69, 3:543–547.

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CHILD HYGIENE

TALIAFERRO CLARK

German Expectant Mothers Employed Industrially—The following minimal requirements should be recognized and adopted for safeguarding the expectant mother: (1) Prohibition of industrial work, on the part of pregnant women for the last three months of pregnancy; (2) limitation of industrial work by pregnant women in the fifth and sixth months of pregnancy to 4 hours a day at the most, and in the third and fourth months of pregnancy to 6 hours a day, with 2 hours rest at noon; (3) remuneration, for the loss of wages, from state funds or from some form of obligatory mutual insurance.

In addition to these general requirements, the following special measures are suggested: (1) Provision of seats in connection with forms of work that require an uninterrupted standing posture or constant walking about; (2) provision of a pleasantly furnished rest room in large industrial plants where women, not only during the rest periods but also in case of weakness or temporary incapacity, may have an opportunity to lie down on a comfortable couch; (3) provision of medicaments that medical experience has shown to be beneficial in pregnancy; (4) provision of canteens for supplying extra provisions, delicacies, beverages and other articles that meet the special needs of pregnant women; (5) employment of factory physicians; (6) establishment of medical consultation hours for pregnant women in large industrial plants; (7) employment of women physicians as industrial superintendents, with the obligation of

devoting special attention to pregnant women and making a special study of the effects of industrial work on the body and the mental and psychic life of women during the period of pregnancy; (8) obligation of the women superintendents to give special time and attention to pregnant women in connection with the labor processes; (9) creation of medical consultation centers for pregnant women in the communes; (10) absolute recognition of pregnancy discomforts as sickness within the meaning of the federal health insurance system as exemplified by health insurance societies; (11) obligation of Krankenkassen to assume the expense of medical treatment and the furnishing of medicaments to the families of insured married persons, and (12) assumption by the Krankenkassen of the hospital expense of a normal as well as a difficult confinement, with a proper per diem allowance.—*Jour. A. M. A.*, Berlin letter, Sept. 12, 1925.

The **Goiter Problem**—Bircher points out that manifestations of poisoning through iodin preparations used for goiter have increased to an alarming extent. There is as yet no iodin preparation that will insure absolute protection against iodin poisoning. Bircher urges that whenever an attempt is made to control goiter by the generalized use of salt known to contain an adequate amount of iodin, the public should be warned that symptoms of poisoning are not only possible but have frequently occurred. As the bearer of a goiter is not a menace to his fellow men, as are the tuberculous, forced medication is not indicated. Salt containing iodin must be plainly so marked.—E. Bircher, *Jour. A. M. A.*, Dec. 20, 1924.

Shriners' **Hospital at Richmond**—The Imperial Shrine Council which met at Los Angeles in June, selected Richmond as one of the cities for a hospital for crippled children. The initial structure will cost about $150,000 and it will be expanded by degrees. The site is to be selected by a committee to be appointed by the council.—*Jour. A. M. A.*, Aug. 1, 1925.

Etiology of **Herpes Zoster and Chickenpox**—Lipschutz succeeded in 1920 in inoculating the rabbit cornea with the contents of vesicles of herpes zoster. The cytologic changes ("zoster bodies") were identical. Kundratitz showed that children up to the age of 5 years could be inoculated with herpes zoster. The incubation was 9 to 15 days. Some of the patients had a generalized eruption with all the earmarks of chickenpox. Other children who came into contact with them contracted chickenpox. Serum from convalescents from zoster protected against chickenpox. It seems, therefore, that the relation between the two diseases is close.—B. Lipschutz and K. Kundratitz, *Wien. klin. Wchnschr.*, Vienna, May 7, 1925.

Sensitization in Infants to Cow's Milk Protein—The diagnosis of this condition usually presents little difficulty on account of the striking and unusual symptoms which appear directly after the first administration of cow's milk. The symptoms usually are, refusal of the infant to take cow's milk after a few drops have been swallowed, followed by pain as evidenced by crying, swelling of the skin and mucous membranes wherever touched by the milk, and symptoms of shock as evidenced by rapid shallow breathing and cyanosis. Sometimes a general urticaria of the skin appears. The treatment consists in desensitizing the infant by giving minute doses of cow's milk which are gradually increased until the necessary amount for the nutrition of the child is administered. To accomplish this usually required three or four months' time.—F. F. Tisdall and I. H. Erb, *Canad. M. A. J.*, Montreal, May, 1925.

Prevention of Simple Goiter—In Hathaway's opinion, a method which would control the goiter situation should consist of the following: (1) Detailed surveys of all localities where goiter is suspected. (2) The institution of treatment with sodium iodid of the water supplies of all cities and towns which prove to be goitrous. (3) Small villages not having a common water supply and rural communities must have iodin supplied either by the use of iodized table salt or by iodin tablets of some kind.—J. C. Hathaway, *Am. J. M. Sc.*, July, 1925.

Virulent Diphtheria Bacilli in Fowls—Two hundred and fifty-six cases were investigated by Litterer in which virulent Klebs-Loeffler bacilli (acute or carrier) existed in a family which owned fowls suffering from ailments such as roup, fowl diphtheria, cholera, etc. The total number of sick fowls examined was 1,126. Out of this number there were 2 instances in which several fowls in each flock harbored virulent diphtheria bacilli. Culturally, tinctorially and by virulent tests, the Klebs-

Loeffler bacilli isolated from the fowls were identical to the diphtheria bacilli isolated from each child in the 2 families owning the fowls. Successful inoculations of the virulent Klebs-Loeffler bacilli isolated from the fowls were produced in other fowls suffering with roup, and these experimental fowls were later cured by the administration of diphtheria antitoxin.—W. Litterer, *South. M. J.*, Birmingham, Ala., Aug., 1925.

Sterilization of the Unfit—In view of the fact that several states have laws, with certain reservations, authorizing sterilization of the unfit, and in other states this question has received considerable attention, the opinion on the legal position of the physician and parents, by Sir Travers Humphries, retained by the British Medical Association, is of interest. He holds that the operation of sterilization is legally an assault and any physician who performs vasectomy or salpingectomy on eugenic grounds would be acting illegally. The only legal justification for performing this operation on a person who from mental weakness is incapable of giving a reasoned consent would be that the operation is necessary on the grounds of health. The legal risks involved in such an operation would attach to all persons concerned—the physician who performed it and the parents who gave consent. The physician would have to answer to a criminal indictment for unlawfully wounding. A civil action for damages could also be brought by the defective or by his next friend in the same manner as actions are now brought by infants, and damages might be recovered from the physician.

The elaborate provisions of the mental deficiency act for the safeguarding of the defectives would appear to indicate that the only means sanctioned by law for preventing the propagation of the unfit is segregation in licensed institutions.—London Letter, *Jour. A. M. A.*, Aug. 1, 1925, p. 369.

Infantile Mortality—The last few years have witnessed a remarkable reduction in the infantile mortality rate in this and several other countries. However, the reduction has not been uniform for each month during the first year of life. The mortality rate for the first 3 weeks of life has remained practically unchanged for a number of years and the improvement noted has occurred in the remaining 11 months of the year. For this reason, workers in this particular field are beginning to inquire whether we have not about reached the limit beyond which a further appreciable reduction is possible. This position is quite clearly set forth in the following editorial comment on the statement in a recent report by the Medical Officer of Health of Dudley, England, with regard to neo-natal mortality, to the effect that these are all conditions which can very materially be affected by ante-natal causes such as constitutional diseases of the mother, hard work and drudgery, want of peace of mind, repeated pregnancies associated with increasing worries of all kinds:

We hope he is right. For with the exception of the first (which is the only one whose influence is proven) all these are theoretically preventable. But we can find little evidence to substantiate this hope. Both neo-natal deaths and stillbirths are most common in first pregnancies where none of these alleged causes operate, and the difference between the rates in the best and least favorably situated mothers of the community does not warrant us in attaching great importance to these alleged and generally accepted "causes." We have got to the end of the seam that we have been working to help us to reduce infantile mortality and must look out for fresh galleries to explore, else we shall remain stationary, if we do not actually go backwards. We, therefore, look out for any fresh evidence, however fragmentary, to guide us. It is necessary, however, to submit all new matter to the keenest criticism. So great are the difficulties ahead, that many able authorities fear that we are at the end of our possibilities; and though we believe that view to be unduly pessimistic, we must expect very little of the matter which is submitted to judgment to stand as being trustworthy or enlightening.—*Med. Off.*, Sept. 12, 1925.

Birth Control Advice at Infant Welfare Centers—At a recent meeting of the Society of Medical Officers of Health, Great Britain, and at the final meeting of the Baby Week Summer School, the question whether advice on methods of birth control should be given at infant welfare centers, was the topic for discussion. Birth control has excited a lively discussion in England, and has been reflected, in greater or less degree, in this country. However, it seems that we are attempting to dodge the issue, which, sooner or later, must be faced squarely. For this reason, the conclusions arrived at in the aforementioned discussions are not without significance to all those interested in the subject of birth control.

It was brought out that contraceptive methods are advocated as remedies for overpopulation, for large families, for maternal mortality and

morbidity from child birth, and for the troubles of many unfortunate women. It was pointed out (1) that to be a member of a large family is an excellent preparation for life, and that the duty of the social system in the premises is to help in the removal of the financial difficulties of some of such families; and (2) that all mothers of large families are not wrecked by child birth, and the remedy in the case of those who are, is an efficient midwifery service—the provision of adequate prenatal supervision, and obstetrical care and lying-in facilities.

Another evil likely to be promoted in the minds of some by the practice of birth control is that in the endeavor to "space" the children may lead to but one child, even if it does not conduce to sterility. "Birth control, as practiced at present, is definitely dysgenic and seems always likely to be so." It will not prevent the propagation of the mentally defective, and contrary to common belief, the woman for whom child bearing should be definitely forbidden is a very exceptional person.

Many of the contraceptive methods are harmful and none are sure. It is for this reason that in France, where they have been extensively practiced, resort to abortion is said to have become more, instead of less, frequent. In Holland, the practice, instead of promoting early marriage has been coincident with later marriages.

The consensus of opinion coming from the audiences at these two meetings was practically unanimous against general advice on the subject at child welfare centers, and a small number favored referring exceptional cases, where the family circumstances were known, either to a special clinic or to a gynecological department.—*Med. Off.*, Aug. 22, 1925.

Adenoids Among School Children—The varying percentages of school children with adenoids reported by different observers is due in large measure to the fact that the diagnosis is based on symptoms of nasal obstruction and mouth breathing rather than direct observation, and also in part to the amount of surgical attention that has been given to these cases. For these reasons, reports of careful observations are valuable for measuring the accuracy of the estimates of the probable number of adenoid cases discovered on school medical inspection in a given community. A report by Dr. H. P. Newsholme of the percentage of adenoids among school children discovered in an investigation at Croydon, England, covering approximately 18,000 children in 31 elementary schools, estimates that the normal prevalence of adenoids among school children should be about 5 per cent, whereas under the existing circumstances only about 2 per cent were observed to be suffering from symptoms calling for operative interference, due to the provision of treatment for these children by the education committee which altered the normal prevalence. This is a strikingly small percentage compared with the estimate by Dan McKenzie that over 30 per cent of all children in Great Britain suffer from adenoids and require operation.

In almost every age period there was a clear excess among boys as compared with girls, and evidence was adduced to show that the disorder reaches a given degree of severity somewhat later in school life among girls than in boys.

Of 4,995 pupils attending 6 schools in the more prosperous districts, 60 cases of severe adenoids, 47 cases of slighter adenoids, and 128 cases which had been operated upon were observed. On the other hand, among 4,534 pupils attending 7 schools in the poorer districts, there were 90 cases of severe adenoids, 69 cases of slighter adenoids, and 163 cases in which an operation had been performed during school life. Among the "prosperous" children aged 5 years, in number 237, there were 7 cases of severe adenoids, 3 of slighter adenoids, and 2 where operation was performed during school life. Among 245 "poorer" children of the same age there were 4 cases of the severe adenoids, 13 of slighter adenoids, and 6 where operation was performed during school life.

Where a definite history was obtainable from parents, it was found that half of the cases who were mouth breathers, one-third of those who were deaf, and one-fourth of those with enlarged tonsils had developed these defects before admission to school. The available data yielded no evidence of any relation between adenoids and bottle feeding or prolonged breast-feeding, nor did they support the theory that the use of a "pacifier" favored the development of adenoids.—*Lancet*, Aug. 22, 1925.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN *

DATES AHEAD—NOVEMBER

3—Election Day.

7-14—Girl Scout Week—Girl Scouts, 670 Lexington Ave., New York, N. Y. The Scouts wish to raise money; possibly you can help the local troops to play up their health work.

8—Red Cross Sunday.

8-14—Father and Son Week—National Council of Y.M.C.A., 347 Madison Ave., New York, N. Y. See local Y.M.C.A. as to whether health may have a share in the week.

8-14—Children's Book Week—National Association of Book Publishers, 25 West 33d St., New York, N. Y. At least this may be the chance to secure books for the children in your sanatorium, hospital, clinic, etc.

11-26—Red Cross Roll Call—American National Red Cross, Washington, D. C. Of course you will share in local Roll Call activities.

16-22—American Education Week (including Community and Health Day)—Bureau of Education, Washington, D. C. Again there is the opportunity for making the best use of Community and Health Day in keeping with local use of this week.

26—Thanksgiving Day. Can you shape Thanksgiving Day events in your local health institution so that you may secure newspaper mention? Any chance to boost wholesome eating on this "stuffed man" day?

26—Opening of Christmas Seal Sale—Address: Your state tuberculosis association: National Tuberculosis Association, 370 Seventh Ave., New York, N. Y. Help the Seal Sale and help your own work on the side!

DECEMBER

Christmas Seal Sale continues.

Midwinter school holidays. Line up a returning football hero for a young people's gathering—to hear about the simple life of an athlete? Or an influential student from a college with high grade health examinations?

6—Golden Rule Sunday—Near East Relief, 151 Fifth Ave., New York, N. Y. The New York office will gladly send you a fascinating report of a vast publicity campaign.

25—Christmas Day.

SCHOOLS AND CHILDREN

The Health Habits Club, by Eleanor M. Fonda. *Hygeia*, Chicago, 3:586-587 (Oct.), 1925. Details of class room use of a health magazine—which happens to be *Hygeia*.

Health in Preparatory Schools, by Mather A. Abbott. *Survey*, 112 East 19th St., New York, 54:620 (Sept. 15), 1925. How Lawrenceville does it.

Human Motives the Lever for Health Instruction, by Ruth Evelyn Henderson. *Red Cross Courier*, Washington, D. C., Sept. 1, 1925. 2 illus. The psychological basis of the project method in health education.

Making Convalescent Children Happy in a Hospital, by Esther Hornor and Abraham Levinson. *Nation's Health*, Chicago, 7:592-594 (Sept.), 1925. 4 illus.

State and Community Coöperation Aids Child Hygiene Work, by A. Elizabeth Ingraham, M.D. *Nation's Health*, 7:523-526, 583 (Aug.), 1925. Describes local functioning of State Department activities in rural districts.

SOME INVITING TITLES

The Cures that Failed—*Popular Health.*

Foot Follies of Foot-weary Folk—*Popular Health.*

How to Feed Your Husband to Keep Him in Shape—*Northwestern Health Journal.*

Making Parenthood Fashionable—*Popular Health.*

Messmates in the Human Body—*Hygeia.*

The Mother To-Be—*Better Health*, Department of Health, Syracuse.

Postponing Our Own Funerals—*Monthly Bulletin*, Indiana State Board of Health.

Queering the Cult—*Medical Economics.*

Shoulders that Droop and Feet that Drag—A bran advertisement.

The Six-fingered Family and the Web-footed Boy—*Popular Health.*

Swimming is 99 Parts Confidence—*Northwestern Health Journal.*

* Please address questions, samples of printed matter, criticism of anything which appears above, etc., to Evart G. Routzahn, 130 East 22d St., New York City.

POPULAR HEALTH ARTICLES

Bolts in the Brain, by Woods Hutchinson, M.D. *Saturday Evening Post,* Sept. 26, 1925. "Why our most delicate organ lasts the longest."

Do as They Did If You Would Be "Healthy, Wealthy and Wise." *Collier's,* 250 Park Ave., New York, July 4, 1925. Exercise by famous Americans.

Glands That Make You Nine Feet Tall. *Popular Health,* Essex Building, Minneapolis, Sept., 1925. "Secrets of the circus freaks."

Health and Sports Suits, by Woods Hutchinson, M.D. *Saturday Evening Post,* Aug. 1, 1925, pp. 20, 21, 137, 138.

Immunity from Communicable Diseases, by W. H. Park, M.D. *Red Cross Courier,* Washington, D. C., May 1, 1925.

I Was Dying—I Made It My Job to Get Well, by Alice Rohe. *Cosmopolitan Magazine,* 119 West 40th St., New York, May, 1925. Reprinted in *Journal of Outdoor Life,* 370 Seventh Ave., New York, August, 1925.

One Way to Get Rid of Mosquitoes, by David Starr Jordan. *Collier's,* July 18, 1925. Cartoon. Fish.

Personal Experience in Three Epidemics of Smallpox, by W. W. Keen, M.D. *Saturday Evening Post,* Feb. 28, 1925.

The Terror of the Night, by W. A. Riley. *Nation's Health,* Chicago, 7:616–617 (Sept.), 1925. 3 illus. The bed-bug.

That Ulcerated Tooth of Pancho Villa. *Popular Health,* Aug., 1925.

Too Much Exercise, by Samuel G. Blythe. *Saturday Evening Post,* July 4, 1925, pp. 10, 11, 129, 130, 133, 134.

The Ways of a Rat, by James H. Collins. *Saturday Evening Post,* Aug. 1, 1925, pp. 36, 74, 76.

Why Babies Die, Editorial. *New Republic,* New York, 42:307–308 (May 13), 1925. Example of magazine use of a report—Casual Factors in Infant Mortality.

METHODS AND PROBLEMS

Can Hospitals be Humane, by Winfred Rhoades. *Survey,* 112 East 19th St., New York, 54:303, 304, 314 (June 1), 1925. When information is important.

Conference on Deceptive Advertising. Associated Advertising Clubs of the World, 383 Madison Ave., New York. Mimeographed bulletin reporting conference with National Health Council, May 5, 1925.

The Henry Street Visiting Nurse. *Survey,* 54:302 (June 1), 1925. 2 illus. How exhibits and visits by contributors displaced an annual report.

House on Wheels Rolling in Health. *Red Cross Courier,* Washington, D. C., Aug. 1, 1925. 1 illus. Home hygiene taught in Honolulu in a little house built over an automobile.

How to Conduct an Auto Accident Campaign, by C. B. Auel. *Red Cross Courier,* July 1, 1925.

International Health Organizations, by Brock C. Hampton. *Public Health Reports* (U.S. P.H.S., Washington, D. C.), Aug. 21, 1925.

"Johnny" Stands for Bandaging. *Red Cross Courier,* Sept. 1, 1925. 1 illus. Bandaging a horse as a stunt to attract attention to first aid.

Make Your Own Illustrations: Linoleum blocks are inexpensive, comparatively easy and most effective. *High School Service* (American National Red Cross, Washington, D. C.), 2:28 (Oct.), 1925. 1 illus. Worth experimenting with in connection with publicity material.

A Museum for Teaching Safety, by A. A. Hopkins. *Hygeia, Chicago,* 3:579–580, (Oct.), 1925. 2 illus. Description of American Museum of Safety.

National Health Museum—Another Means of Hygienic Education, Editorial. *Nation's Health,* Chicago, 7:555 (Aug.), 1925. "Is it not time to create at Washington a National Museum of Health?"

The Obligation of the Profession to the Factory Worker, by E. L. Pettibone, D.D.S. *Journal of American Dental Association,* Chicago, 12:213–217 (Feb.), 1925. Describes mouth hygiene work and illustrates educational material in factories.

Over the Top, by Robert Benchley. *Liberty,* Chicago, July 18, 1925. A humorous, critical account of money-raising "drives."

Preparing Effective Health Posters Quickly. *Public Health Reports,* 40:1560 (July), 1925. 1 illus. Use of photostat in emergency educational work.

Puppet Plays Teach Health to Czechoslovak Children, by Karel Driml, M.D., Ministry of Health, Czechoslovakia. *Nation's Health,* 7:463, 464, 512 (July), 1925. 5 illus. Readable account of puppet shows and children's plays in a country where there are 2,000 permanent small marionette theaters.

The Red Cross in India: Health Propaganda. *World's Health,* League of Red Cross Societies, 2 Avenue Velasquez, Paris, July, 1925. One of a series of two-page reproductions in color of health education posters issued in various countries.

Salesmanship in Public Health, by W. C. Rucker, M.D. *Nation's Health*, 7:532–533 (Aug.), 1925. "The official who convinces his community of the value and honesty of his work is the one who succeeds."

That Peaceful Spot—the Rest Tent. *Red Cross Courier*, Aug. 15, 1925. Describes the rest tent, with emergency equipment, at the county fair.

Tuberculosis Association Campaigns Against Spitting. *Nation's Health*, 7:497 (July), 1925. 1 illus. How Indianapolis carried out suggestions of the National Tuberculosis Association.

The Use of Case Stories in Newspaper Publicity, by Mary Swain Routzahn. *The Family*, 130 East 22d St., New York, 6:168–170 (Oct.), 1925. Report of a conference conducted by Committee on Publicity Methods. Reprints 10 cents. Address Committee at 130 East 22d St., New York.

The Value of Opposition, Editorial. *Nation's Health*, 7:483 (July), 1925. How opposition aids education.

Put Yourself on Your Mailing Lists—"The best way to borrow the other man's eyes for a naturally proportioned perspective of your by-mail propaganda is to have a sample of every piece you distribute addressed to you at your home. When it arrives put yourself in a proper state of mind to disclaim any previous knowledge of or familiarity with the advertising at hand. You are not Mr. Price whose article is being advertised or Mr. Spence whose nimble brain created the printed message. Who are you when you open up this mail, but one of those mysterious 'average people' who are to receive your appeal letter or your words of more or less wise advice?"

The above quotation is followed, in *Postage*, by suggestions as to how to look at that precious mail so that you may judge it critically.—It Pays to Borrow the Other Man's Eyes. *Postage*, 18 East 18th St., New York, 13:620 (Sept.), 1925.

"Dates Ahead"—What holidays, anniversaries, special weeks, campaigns and conventions planned for 1925–1926 are of significance to publicity workers in social welfare? What dates during that period should be avoided in making our plans, and what dates can be utilized to advantage in our publicity activities? What conventions would be of value to publicity workers for the professional information they will offer, and what conventions might be sources of news for our local newspapers? These questions are answered in "Dates Ahead," a mimeographed bulletin of 10 pages prepared by E. G. and M. S. Routzahn for the Committee on Publicity Methods. Copies may be secured for 20 cents each of the Committee at 130 East 22d St., New York, N. Y.

"Where May I Secure Ready Made Lantern Slides?"—"Please tell me where I may secure ready made lantern slides to be used for teaching hygiene, pathology and bacteriology to nurses. We prefer to purchase rather than to borrow." Please address your replies to Dr. W. F. Thomson, 927 San Jacinto Life Building, Beaumont, Texas. Kindly send copy of your answer to the editor of this department so that the information may be passed on to others.

A Dinner Conference Follow-Up—"That there has been no answer from you to our letter of Monday is causing me uneasiness and I am writing again today to urge that you send me a prompt acceptance of the invitation to the Dinner Conference. . . ."

This was the opening paragraph of a letter from the General Chairman of the United Drive of the Jewish Charities of Chicago.

Where is the American Agamede?—"The Women's Foundation for Health, 370 Seventh Avenue, New York, N. Y., has announced through the press the awarding of a bronze medal to a woman in each state who has during the past year or years rendered the greatest service to women. It is to be known as the Agamede Medal. A national committee will then select from the whole group the one to whom the gold medal will be awarded.

"The Women's Foundation for Health will adjudge her 'that woman citizen of the American Republic who has performed during the last year the most distinguished service in advancing the health and happiness of American women generally.' The medal will be bestowed on a woman whether she be scientist, housewife, actress, business woman, or woman of wealth and social position. Each state will first name its Agamede, and the national Agamede will then be chosen from the forty-eight selections. Each state winner will be awarded a bronze medal."—*Monthly Digest* of National Health Council. Why not invite the women's organizations of your city to send delegates to a committee to select a nominee? First send to New York for particulars.

A "Human Interest" Story on Birth Registration—The story which follows was supplied by the American Child Health Association to the Foreign Language Information Service last year and published in 117 papers, in nine languages. It illustrates one way of making birth registration interesting and significant:

Tony Antino had been working for several years on the small piece of land on Long Island that his neighbors dignified as Tony's farm. Tony's family of seven children worked with him.

At the end of a prosperous harvest Tony and his family went back to sunny Italy for a visit. It had been a very happy winter for the Antinos and they were quite ready to return to America to start their gardening for another season. While they lay in quarantine off Ellis Island it was discovered that the two younger children had developed trachoma and they could not be admitted to the United States. Tony tried to prove that they had a right to the land of their birth, the United States. But the calloused and not easily beguiled port authorities demanded credentials. If his two youngest children had been born in this country, why didn't he have a birth certificate to prove his verbal statements?

Unfortunately Tony and the doctor who had officiated at the birth of these two children had neglected to register their births. Their citizenship could not be established.

The Antinos were forced to return to Italy. There again they were excluded being regarded as American citizens and undesirable aliens, because the children had developed trachoma. Still the Antinos are wanderers and a scrap of paper recording the birth of the two sick children would give them legal citizenship in the United States and reëstablish the family on the little Long Island farm that is rapidly slipping into ruin.

Has your baby a birth certificate?

An explanation of birth registration followed the story. Doubtless the American Child Health Association, 370 Seventh Avenue, New York, N. Y., will supply a copy of the complete article for publication in other papers.

Superstition Holds Sway in High Schools—"High school pupils are steeped in superstitious beliefs to a surprising degree, declares Dr. Isaac D. Rawlings, Illinois State Health Director, who bases his opinion upon a survey recently completed by a member of the Illinois State Academy of Science. Ten obsolete, traditional notions, long since exploded and discredited by scientific observation, were put to 1,581 pupils in 35 high schools of Illinois, Indiana, Kentucky, and Tennessee in the form of questions. From 2 to 60 per cent of the pupils expressed a positive belief in the various notions, the faculties of two modern high schools near Chicago requesting that the names of their schools be omitted from publicity in order to avoid embarrassment.

"'The survey showed,' said Dr. Rawlings, 'that 19 per cent of the pupils believe that a "mad stone" will prevent hydrophobia if applied to a wound created by the bite of a rabid dog; 26 per cent believe that warts can be removed from the hands through a series of mysterious maneuvers on the part of certain persons called charmers; 60 per cent believe that malaria is caused by drinking stagnant or swampy water contaminated in some mysterious way; 23 per cent believe that a horse hair, when left in a watering trough or swallowed, will be converted into a snake-like, disease producing worm. Other questions related to "hoop snakes," the influence of moon on vegetable growth, the comparative number of ribs in men and women, etc.'"—From press release issued by Illinois State Department of Public Health, Springfield.

The editor of this department hopes to have copies of the lists of questions to supply to those who may wish to apply this test locally in their schools.

Trade Papers for Publicity Workers—How much good you will get from reading the trade journals of advertising, printing, and other lines upon which the health worker must depend in the production of his publicity material depends upon the individual. The one safe suggestion is to give the trade papers a hearing—get at least a single copy now and then and look it over. *Printers' Ink Monthly* for September, 1925, is a little better than usual probably, but a fair sample. Enclose 25 cents to 185 Madison Avenue, New York, and try it out. Even some of the illustrations in advertisements are suggestive of possibilities in health printed matter. Other trade periodicals will be introduced from time to time through this department.

Convention Daily—A four page daily bulletin, 10¼ x 12 inches, was issued by the National Tuberculosis Association during its recent convention. The distinctive features were the newspaper layout of the pages and the "humor," illustrated and otherwise. Samples will be supplied by Dwight S. Anderson, 370 Seventh Ave., New York, N. Y.

Undesirable Publicity—News dispatches from Detroit and Washington, as reported in *Monthly Digest* of National Health Council, have told of a proposed anti-Anti-Saloon League campaign by a "National Committee to Prevent Blindness." This is not the very non-partisan National Committee for the Prevention of Blindness. And you may be safe in urging people not to believe the unbelievable when published about genuine health organizations.

August Best Sellers—As reported by the book trade to *Publishers' Weekly* the "best sellers" among non-fiction books is again headed by Diet and Health; Cushing's Life of Sir William Osler being in ninth place. Health interest, possibly, is also represented by Boston Cooking School Cook Book which held third place. Incidentally Arrowsmith is now tenth among fiction.

European and Mexican Poster Art—The international poster competition conducted by the League of Red Cross Societies brought responses from 30 countries, a total of 333 posters. The prize for the winning poster was awarded to M. Barcinski of Poland. A supplement to *World's Health*, September, 1925, reproduces in color 16 of the entries, including those given awards by the jury of eminent artists. The collection is interesting for the examples of poster technique from various countries and for the illustration of attempts at symbolism.—League of Red Cross Societies, 2 Avenue Velasquez, Paris, France. 10 cents.

Health Exposition—A national exposition on health, social welfare, and physical training is to take place in Dusseldorf in 1926 under the auspices of the National Government and with the coöperation of the state governments and various private organizations. The purpose of the exposition is to point out to the German people the importance of proper care of the health, to enable them to meet their obligations in Germany and outside of it. More than 1,000 specialists in various fields are engaged in arranging for the exposition. *Volkswohlfahrt* (Berlin), June 1, 1925.

What is Your Record?—"Our Babies" is a newspaper column prepared by the Royal New Zealand Society for the Health of Women and Children, Dunedin. The 1925 annual report states that "during the past eighteen years this column has appeared practically every week. It is published by between 50 and 60 newspapers throughout the Dominion of New Zealand, and is also printed in Australia and South Africa, as well as in some parts of the United Kingdom."

"A Chance to Learn Reporting"—Under this heading *High School Service* carries this offer from the Public Information Service of the American Red Cross: "Whenever you prepare a Red Cross publicity story for the paper, send a copy to this Service at American Red Cross National Headquarters and members of the staff will give it careful consideration and return it with constructive criticisms."

The editor of this department will risk offering a similar service on the part of the Council of the Education and Publicity Section. If too many take advantage of this offer we will call it off. Send your offerings in care of the editor.

Health Film Services—The list of health motion pictures issued in two editions by the National Health Council, according to *Monthly Digest* of the Council, "has lost a great deal of its usefulness in that many of the owners and distributors have gone out of business or have changed hands. In June of this year it was decided to prepare an entirely new one and at the same time set up in the Council a more comprehensive film service—one that would enable the Council to answer all questions not only with regard to contents, price, distributor, etc., but also to suggest programs and to provide decentralized distributing facilities. At the present time the Metropolitan Life Insurance Company is compiling all of the necessary data for the National Health Council and will print the information obtained in the form of a new film list, which will be made available to those requesting it. A questionnaire has already been sent out to about 2,000 persons requesting information regarding not only motion pictures but the availability of projection machines, stereoptican machines, slides and exhibits in all parts of the United States.

"The National Health Council Films Committee will resume its regular monthly meetings beginning about the first of October. The purpose of this committee is to review and criticize constructively any film on public health. The committee is also prepared to criticize scenarios and give information regarding the making of health films." Address correspondence to Thomas C. Edwards, National Health Council, 370 Seventh Avenue, New York, N. Y.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B.

Legal and legislative material relating to public health seems to have been rather scanty since the last issue of the JOURNAL. Attention is therefore called to certain allied subjects of considerable importance.

Political Science and Public Health—Political science is defined in the *Standard Dictionary* as "the science of the form of and principles of civil government, and the extent and manner of its intervention in public and private affairs." A simpler definition is that political science is the organized body of knowledge pertaining to the state. Familiarity with the principles of political science is obviously desirable for sanitarians, for they are concerned with an important phase of public service. Conversely, experts in political science ought to know something about the modern aspects of public health. Yet, it is safe to assert that the average sanitarian has neglected to pay much attention to political science, and it is true that few writers on this latter subject seem to have an adequate conception of the rôle of hygiene and sanitation and the administration of public health.

Most authorities on political science are, in fact, inclined to class the care and protection of public health as among the secondary functions of government. They declare that the essential duties of organized society are to maintain internal police, order, and safety, to protect persons and property, and to preserve external security. According to Professor Garner, in his *Introduction to Political Science*, the indispensable functions of the state are those which have to do principally with the conservation of society, and only secondarily with social progress. The protection of the public health accordingly is placed with such duties as the operation of postal service, the construction of public works, the promotion of education, and the regulation of trades, all of which would be unprofitable as private ventures, but are required by the common good, and so are classed as the nonessential, or doubtful functions of government.

With this attitude, sanitarians can hardly agree. The promotion of the public health is indubitably an essential feature of government. It is so because it is an integral part of safety and security; it is so because it is one of the most important portions of the police power; it is so because the development of an improved national vitality is fundamental to the progress of any country. As Herbert Spencer wrote: "The government which does not diligently protect the health of its citizens is neither intelligent nor moral." And Disraeli characterized the care of the public health as the first (not the second, or third) duty of the statesman. If further argument is needed there may be quoted the very sound observation of Burkart: "Sanitary, civic and moral decadence was the worm at the root of every discredited and submerged civilization of the past." The glory that was Greece and the grandeur that was Rome are said to have been destroyed by microbic diseases.

While, however, we condemn the restricted viewpoint of political scientists in not evaluating public health in its true light, we must pause and ask ourselves if sanitarians always regard political science with as broad a conception as they should. The health worker is, unfortunately, often inclined to visualize everything in accordance only with his own interest. He thinks, for instance, that any measure whatsoever taken by him is justified, so long as he interprets it to be in the interests of the public health. He sometimes forgets that government guarantees to all citizens certain personal rights, such as the security of life, liberty, and property, and the equal protection of the laws. That is why the sanitarian should endeavor to become acquainted with some of the significant features of political science and especially with the constitutional limitations on the practice of his profession and the legal foundations of public health. If he would do this, his path would be singularly cleared of some of the difficulties with which he is now often confronted.

Two notable books on political science have recently been published and they are hereby recommended for perusal by sanitarians. The first of these is *Introduction to American Government*, and is written by Professors Frederick A. Ogg and P. Orman Ray, political scientists of established reputation. A second edition of this book, thoroughly revised and brought up to date, has been issued in 1925 by the Century Company (New York). This 600 page book, the price of which is $3.25, is written in a readable style and covers in a fascinating manner all of the principles and problems of our national government.

Although the book does not touch directly on public health, it does bring out many constitutional, governmental, and administrative subjects, which have a direct bearing on public health practice and procedure. The protection of the health of the people is, under our system of government, primarily vested in the individual states, forming a part of their police power. The exercise of this power is, nevertheless, subject to certain constitutional limitations, restrictions with which sanitarians should be familiar. This particular book discusses the nature and functions of government in general; the foundations of our own government, both its origin and system; and the structure, operation, and powers of the national establishment. This last portion considers not only the system, but the basis of popular control. All of it is a necessary part of the education of any sanitarian.

The other book, *Our Governmental Machine*, was written by Schuyler C. Wallace, and published in 1924 by Alfred A. Knopf. It is more in the nature of a philosophical treatise on the fundamental processes and relationships of our governmental machinery. It is intended for the beginner in the study of the science of politics, and as a consequence may be appropriate for reading by sanitarians. The four parts of the book take up: (1) popular control; (2) the legal frame of government; (3) lawmaking; and (4) the executive and the administration. As in the case of the book by Ogg and Ray, no specific outline or discussion of public health will be found here; but government, of which health protection is an essential feature, is interestingly exposited. The cost of this 223 page book is $2.00.

This subject of the relation of public health and political science is such a significant one that a paper on the topic is planned for the Health Division of the National Conference of Social Work at its next meeting in Cleveland in May. A real authority will present the subject in much more detail than can be done here.

Workmen's Compensation—Another book which has been handed to the associate editor for review is *Workmen's Compensation Insurance*, by G. F. Michelbacher and Thomas M. Nial, issued in 1925 as one of the McGraw-Hill (New York) Insurance Series, and selling for $4.00. It contains 503 pages and is divided into three parts, the first dealing with injuries and their prevention, the second with methods of indemnification for industrial injuries, and the third with workmen's compensation and employers' liability insurance. There are also a score or more appendices, giving tables, forms, sample material such as posters and safety letters, and other useful data. A list of references and an index complete this volume, which ought to be useful to any person interested in the subject. Occupational diseases, with which sanitarians are concerned, are discussed in two places and have devoted to them about 5 pages, numbers 23 and 24, and 135 to 138. The authors believe that occupational diseases should be treated as accidents, which is in consonance with the best modern scientific opinions on this subject, though only seldom is such a provision included in the various state laws. There is, in fact, wide divergence on this point, and little, if any, uniformity. The Federal Compensation Act (39 Stat. 742), it might be remarked, was amended on June 5, 1924 (43 Stat. 389), to include as compensable diseases proximately caused by the employment. This amendment was passed after the Comptroller had ruled adversely on payments for such diseases.

Apropos of workmen's compensation, the Supreme Court of Minnesota has ruled that cancer caused by an injury during the course of employment is an accident, and has upheld an award for this cause. The case is Austin v. Red Wing Silver Pipe Co., 204 N. W. 323, and is abstracted in the *Monthly Labor Review* of the United States Bureau of Labor statistics for September, 1925 (page 150). This bureau, by the way, is the authority on workmen's compensation and has made many valuable studies on the state laws and court decisions pertaining to the topic. The Federal Compensation Act, though, is administered by a separate commission. This fact, is one of the many incongruities in the organization of the federal executive departments, for there is no reason why all of this work, investigatory as well as administra-

tive, should not be under central direction. Such a procedure would certainly conduce to economy and probably would be more efficient. The Bureau of Labor statistics did administer the first Federal Compensation Act of 1908, but when the later law of 1916 was passed, to take care of all federal employes, an Employes' Compensation Commission was created to execute the necessary duties.

How It **Was Done in Delaware**—Promotion of necessary health legislation is often an important duty of the sanitarian. As anyone who has ever attempted it knows, this task is something of art. How a bill of significance to the health of Delaware was successfully put through the legislature at its last session is interestingly narrated in the *Bulletin of the National Tuberculosis Association* for September, 1925. The measure which it was desired to have passed was one to transfer a privately supported sanatorium to the control of the state. An attempt had been made in 1923 to have this done, but had failed. A survey of tuberculosis work in Delaware was thereupon made by the National Tuberculosis Association, at the request of the governor. The facts ascertained proved useful in the legislative campaign which came later.

The way the result was achieved was by placing a qualified expert from the national association in the state and having him stay there until the law had been passed. His methods are of special interest. His cause, which of course had the support of the state health officer, was presented to the influential Women's Joint Legislative Committee, which promptly espoused it and lobbied strenuously for the bill, which had appropriately been introduced by the first woman legislator of Delaware. An alliance was also made with the State Parent-Teacher Association, and endorsement obtained from the important granges. The governor, incidentally, happened to be a prominent grange official. A set of posters was prepared and a 4-page pamphlet, giving pertinent facts about the tuberculosis situation in the state, was printed and 10,000 copies distributed. A part-time publicity expert was engaged and as a result nearly a thousand inches of newspaper space were devoted to this matter. The field man from the national association kept in the background and worked through his lobby and not directly with the legislators, as these august personages often resent outside influences.

The bill passed and was signed by the governor. How simple it all seems. Yet how difficult it really is to induce the farmers, lawyers, and business men, who comprise legislatures to adopt worth-while health and social legislation. As was said above, it is an art.

If one reads Mr. Wallace's chapters on lawmaking, however, another side of the picture is apparent. What one person thinks is of vital importance does not always so impress the majority.

CONVENTIONS

November 9–12, Southern Medical Association, Dallas, Tex.

November 13–18, National Woman's Christian Temperance Union, Detroit, Mich.

November 17–19, American Civic Association, Pittsburgh, Pa.

December 3, National Dairy Council, Chicago, Ill.

December 3–5, National Society for Vocational Education, Cleveland, O.

December 7–11, Radiological Society of North America, Cleveland, O.

December 8–11, New York State Conference of Charities and Correction, New York, N. Y.

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What Margaret C. McKinney, Executive Secretary of KNOX COUNTY ANTI-TUBERCULOSIS ASSOCIATION, says:

"We felt that to be used just for educational purposes, and not to bring us in any money, it was rather extravagant, but since seeing the 'hit' it made, we feel it was money well spent."

AMERICAN PUBLIC HEALTH ASSOCIATION

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